

# iBook (800 MHz 32 VRAM), iBook (900 MHz 32 VRAM), iBook (14.1 LCD 900 MHz 32 VRAM) - Technical Specifications

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iBook (800 MHz 32 VRAM), iBook (900 MHz 32 VRAM), iBook (14.1 LCD 900 MHz 32 VRAM) - Technical Specifications

Configurations			
Order number	M8758LL/A	M9018LL/A	M9009LL/A
Processor	800MHz PowerPC G3	900MHz PowerPC G3	900MHz PowerPC G3
Level 2 cache	512K at 800MHz	512K at 900MHz	512K at 900MHz
System bus	100MHz	100MHz	100MHz
Memory	128MB; expandable to 640MB	128MB; expandable to 640MB	256MB; expandable to 640MB
Hard drive <sup>5</sup>	30GB Ultra ATA	40GB Ultra ATA	40GB Ultra ATA
Optical drive	CD-ROM	Combo (DVD-ROM/CD-RW)	Combo (DVD-ROM/CD-RW)
Display	12.1-inch (diagonal) TFT XGA	12.1-inch (diagonal) TFT XGA	14.1-inch (diagonal) TFT XGA
Graphics support	ATI Mobility Radeon 7500 with 32MB of DDR SDRAM	ATI Mobility Radeon 7500 with 32MB of DDR SDRAM	ATI Mobility Radeon 7500 with 32MB of DDR SDRAM
FireWire 400	One port	One port	One port
USB	Two ports	Two ports	Two ports
VGA, S-video, and composite video output <sup>8</sup>	Yes	Yes	Yes
Modem <sup>6</sup>	56K V.92	56K V.92	56K V.92
Ethernet	10/100BASE-T	10/100BASE-T	10/100BASE-T
Wireless networking <sup>3</sup>	AirPort ready	AirPort ready	AirPort ready
Software	Mac OS X, Mac OS 9, QuickTime, iCal, iChat, iLife (includes iTunes, iPhoto, and iMovie), iSync, DVD Player, AppleWorks, Mac OS X Mail, Microsoft Internet Explorer, EarthLink (includes 30 days of free service), AOL, Quicken 2003 Deluxe,World Book 2003 Edition, Mac OS X Chess, Otto Matic, Deimos Rising, Microsoft Office v. X Test Drive, Sound Studio, FAXstf, and Acrobat Reader; Apple Hardware Test CD		
Service and support	90 days of free telephone support and one-year limited warranty		
Also included	Built-in keyboard and trackpad, Apple VGA Display Adapter, modem cable, power adapter, AC wall plug, power cord, lithium-ion battery		

**Options**

In addition to choosing from Apple’s preconfigured systems, you can order an iBook with factory-installed options such as additional RAM, a larger hard drive, and AirPort wireless networking from the Apple Store or an Apple Authorized Reseller.

**Technical Specifications**

Processor and memory

- 800MHz or 900MHz PowerPC G3 processor with 512K on-chip level 2 cache running at full processor speed
- 100MHz system bus
- One of the following memory configurations:
  - 128MB of SDRAM built in
  - 256MB of SDRAM (128MB built in and 128MB in SO-DIMM slot)
- Single 1.25-inch standard SO-DIMM slot (3.3V) supports up to a 512MB SO-DIMM for a total of 640MB of SDRAM

Storage

- 30GB or 40GB Ultra ATA hard disk drive<sup>5</sup>
- One of the following optical drives:
  - 24x-speed (maximum) CD-ROM drive
  - Combo drive (DVD-ROM/CD-RW); writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 10x speed, reads DVD-ROM discs at up to 8x speed, reads CD-ROM discs at up to 24x speed

Display

- Choice of built-in 12.1-inch (diagonal) or 14.1-inch (diagonal) TFT XGA active-matrix display
- Support for millions of colors at 1024-by-768-pixel resolution
- Support for resolution scaling to 800-by-600-pixel and 640-by-480-pixel resolution with millions of colors

Graphics support

- ATI Mobility Radeon 7500 graphics accelerator with 32MB of dedicated video memory and AGP 2X support

Communications

- Built-in 56K V.92 modem (RJ-11 connector)<sup>6</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and expansion slot for optional 11-Mbps AirPort Card (802.11b Wi-Fi certified)<sup>3</sup>

Peripheral connections

- Two 12-Mbps USB ports
- One FireWire 400 port at up to 400 Mbps<sup>7</sup>

Audio

- 16-bit CD-quality stereo sound output minijack
- Built-in stereo speakers
- Built-in microphone

Video

- VGA video output for video mirroring on an external display or projector (24-bit color) with included Apple VGA Display Adapter
- S-video and composite video output to TV or projector (requires Apple Video Adapter, sold separately)

Battery

- iBook with 12.1-inch display: 46-watt-hour lithium-ion battery provides up to 5 hours of battery life on a single charge<sup>1</sup>
- iBook with 14.1-inch display: 55-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge<sup>1</sup>
- Integrated charge indicator LEDs on battery

Keyboard and trackpad

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement), and embedded numeric keypad
- Solid-state trackpad for precise cursor control; supports tap, double-tap, and drag capabilities

Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 140° F (–25° to 60° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

Size and weight (iBook with 12.1-inch display)

- Height: 1.35 inches (3.4 cm)
- Width: 11.2 inches (28.5 cm)
- Depth: 9.06 inches (23.0 cm)
- Weight: 4.9 pounds (2.2 kg)<sup>2</sup>

Size and weight (iBook with 14.1-inch display)

- Height: 1.35 inches (3.4 cm)
- Width: 12.7 inches (32.3 cm)
- Depth: 10.2 inches (25.9 cm)
- Weight: 5.9 pounds (2.7 kg)<sup>2</sup>

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

1. Battery life depends on configuration and use.
2. Weight varies by configuration and manufacturing process.
3. Wireless Internet access requires AirPort Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.
4. CD burning requires CD-RW drive. iTunes is for legal or rightholder-authorized copying only. Don’t steal music.
5. 1GB = 1 billion bytes; actual formatted capacity less.
6. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.
7. Actual rates will vary.
8. Connection to TV requires Apple Video Adapter, sold separately.

# Xserve RAID - Technical Specifications

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Configurations			
Order number	M8668LL/A	M8669LL/A	M8670LL/A
Total available storage <sup>1</sup> —RAID 0	720GB	1260GB	2.52TB
Usable storage <sup>1</sup> —RAID 1	360GB	540GB	1.08TB
Usable storage <sup>1</sup> —RAID 3 and 5	540GB	1.08TB	2.16TB
ATA/100 Apple Drive Modules (7200 rpm)	Four 180GB drives	Seven 180GB drives	Fourteen 180GB drives
On-drive cache	8MB per drive	8MB per drive	8MB per drive
Expansion	90 days of free telephone support and one-year limited warranty; optional extended service and support products		

Also included	Mounting screws with M5, M6, and 10/32-inch threads; caged nuts; two agency-approved 12-foot power cables
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Technical Specifications	
RAID controllers and cache memory	<ul style="list-style-type: none"><li>Dual independent controllers, each with environment management coprocessor for out-of-band remote management and monitoring</li><li>128MB of cache per controller (256MB total); support for up to 512MB per controller (1GB total)</li><li>Cache Backup Battery Modules (sold separately) for over 72 hours of memory protection</li></ul>
RAID operation	<ul style="list-style-type: none"><li>Support for RAID levels 0, 1, 3, 5, 0+1,10, 30, 50 (10, 30, and 50 require host-based software RAID)</li><li>Support for multiple RAID sets, multiple hosts, and LUN masking</li><li>Background RAID set creation; automatic variable background rebuilding; global drive hot sparing (per RAID controller)</li></ul>
Fibre Channel storage-to-host connection	<ul style="list-style-type: none"><li>Dual 2Gb Fibre Channel ports (HSSDC2), 200MB/s throughput per channel with guaranteed bandwidth (400MB/s full duplex)<sup>2</sup></li><li>Host connectivity using 2Gb Apple Fibre Channel PCI Card (sold separately) or compatible third-party PCI card</li><li>Support for point-to-point, loop, and fabric (switched) topologies</li><li>Dual 10/100BASE-T Ethernet for remote management</li></ul>
Apple Fibre Channel PCI Card (sold separately)	<ul style="list-style-type: none"><li>64-bit, 66MHz card with dual SFP 2Gb Fibre Channel ports; compatible with 32-bit, 66MHz slots</li><li>Two 2.9-meter Fibre Channel copper cables (SFP transceiver to HSSDC2); compatible with SFP fiber-optic cables and transceivers</li></ul>
Cooling	<ul style="list-style-type: none"><li>Redundant hot-swap cooling modules with self-regulating speeds and front-to-back cooling</li><li>Environmental monitoring system for automatically maintaining optimal ambient temperature</li></ul>
Electrical requirements	<ul style="list-style-type: none"><li>Redundant load-sharing hot-swap power supplies (450W); universal input (90V to 264V AC), power factor corrected</li><li>Maximum input current: 7.1A (90V to 132V) or 3.5A (180V to 264V)</li><li>Power usage: 300W typical continuous power, 400W maximum continuous power</li><li>Dual DB-9 serial ports for UPS systems</li><li>Frequency: 47Hz to 63Hz, single phase</li></ul>
Environmental requirements	<ul style="list-style-type: none"><li>Operating temperature: 50° to 95° F (10° to 35° C)</li><li>Storage temperature: -40° to 116° F (-40° to 47° C)</li><li>Relative humidity: 5% to 95% noncondensing</li><li>Maximum thermal output: 1365 BTUs per hour</li><li>Maximum altitude: 10,000 feet</li><li>FCC Class A approved</li></ul>

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Size and weight	<ul style="list-style-type: none"><li>■ 5.25 inches (13.3 cm) high by 17 inches (43.2 cm) wide by 18.4 inches (46.7 cm) deep</li><li>■ Fits EIA-310-D-compliant, industry-standard 19-inch-wide four-post racks from 24 to 36 inches deep; deeper racks require third-party extender</li><li>■ 60 to 110 pounds (27 to 45 kg), depending on configuration</li></ul>
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1. For hard drive capacity measurements, 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less. Usable capacity depends on drive configuration and RAID level.
2. Actual rates will vary depending on configuration and RAID level.
3. Host operating system limitations apply.
4. Automatic rebuild requires a designated hot spare; not available for RAID level 0.
5. A separate AppleCare Premium Service and Support Plan must be purchased for each Xserve RAID system to be covered. To qualify, your Xserve RAID system must be within its one-year hardware warranty. Coverage ends three years after date of Xserve RAID purchase. Actual onsite response time and availability of onsite service depend on location; see [www.apple.com/support/products/premium](http://www.apple.com/support/products/premium) for details. Local telephone fees may apply; telephone numbers may vary and are subject to change.

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# Xserve (Slot Load) - Technical Specifications

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## Xserve (Slot Load) - Technical Specifications

Configurations			
Order number	Single-processor server M8888LL/A	Dual processor server M8889LL/A	Cluster node M9090LL/A
Processor	1.33GHz PowerPC G4	Dual 1.33GHz PowerPC G4	Dual 1.33GHz PowerPC G4
On-chip L2 cache	256K at 1.33GHz	256K at 1.33GHz per processor	256K at 1.33GHz per processor
L3 cache (DDR SRAM)	2MB	2MB per processor	2MB per processor
System bus	167MHz	167MHz	167MHz
Memory (PC2700 DDR SDRAM at 333MHz)	256MB	512MB	256MB
Memory expansion	Four DIMM slots supporting up to 2GB using 128MB, 256MB, or 512MB DIMMs		
Hot-plug storage <sup>1</sup>	Four drive bays with independent 133MB/s buses supporting up to 720GB, using 60GB ATA/133 drives with 2MB disk cache and/or 180GB ATA/100 drives with 8MB disk cache; standard configurations come with one 60GB Apple Drive Module		One drive bay with 60GB ATA/133 Apple Drive Module
Optical drive	Slot-loading CD-ROM or optional Combo drive (DVD-ROM/CD-RW)		None
Gigabit Ethernet interfaces (10/100/1000BASE-T RJ-45)	One on logic board and one on card installed in PCI/AGP slot		One on logic board
PCI slots	Two 64-bit, 66MHz PCI slots and one half-length 32-bit, 66MHz combination PCI/AGP slot		Two 64-bit, 66MHz PCI slots
Ports	Back panel—two FireWire 800, two USB 1.1, one DB-9 (RS-232); front panel—one FireWire 400Back panel—two FireWire 800, two USB 1.1, one DB-9 (RS-232); front panel—one FireWire 400		
Graphics	One ATI card (32MB of DDR SDRAM and VGA connector) installed in lower PCI slot; optional AGP 4X card (64MB of DDR SDRAM; DVI, VGA, and S-video connectors; dual display support) installed in PCI/AGP slot		None
Service and support	90 days of free telephone support and one-year limited warranty; optional extended service and support products		
Also included	Mounting screws with M5 and 10/32-inch threads; caged nuts; cable management arm for four-post racks; agency-approved 12-foot power cable		

Software			
Mac OS X Server	Unlimited-Client Edition	Unlimited-Client Edition	10-Client Edition
Included services	<ul style="list-style-type: none"><li>File sharing: Macintosh (AFP over TCP/IP), Windows (SMB/CIFS), Internet (FTP), UNIX and Linux (NFS)</li><li>Printer sharing: Macintosh and UNIX (LPR/LPD), Windows (SMB/CIFS), AppleTalk PAP</li><li>Directory services: Open Directory (LDAPv3, NetInfo), Password Server (SASL), BSD configuration files (/etc), Kerberos v5 authentication (AFP, FTP, mail)</li><li>Internet: Apache web server, SSL,WebDAV, mail server (SMTP, POP, IMAP),Webmail, Java virtual machine (J2SE), JavaServer Pages, Java Servlets,WebObjects 5.2 Deployment,4 PHP, Ruby, MySQL, SOAP, XML-RPC</li><li>Media streaming: QuickTime Streaming Server, QuickTime Broadcaster (MPEG-4)</li><li>Workgroup management:Workgroup Manager, NetBoot,4 Network Install, Macintosh Manager4</li><li>Networking and security: BSD networking, SSH2, IP firewall, DHCP server, DNS server</li><li>Remote management: Server Monitor, Server Settings, Server Status, SNMPv3, Neon Software bundle, command-line tools</li></ul>		
Included developer tools	Project Builder, Interface Builder, AppleScript Studio, PackageMaker, additional SDKs, compilers, debugging and profiling tools, sample code, and documentation		

Physical Specifications	
Rack support	<ul style="list-style-type: none"><li>Fits EIA-310-D-compliant, industry-standard 19-inch-wide racks, including four-post racks (24 inches, 26 inches, and from 29 to 36 inches deep) and two-post telco racks (center-mount brackets included)</li><li>Front-to-back cooling for rack enclosure</li></ul>

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Electrical and environmental requirements	<ul style="list-style-type: none"><li>■ Line voltage: universal input (90V to 264V AC), power factor corrected</li><li>■ Maximum input current: 3.6A (90V to 132V) or 1.8A (180V to 264V)</li><li>■ Frequency: 47Hz to 63Hz, single phase</li><li>■ Output power: 345W</li><li>■ Operating temperature: 50° to 95° F (10° to 35° C)</li><li>■ Storage temperature: –40° to 116° F (–40° to 47° C)</li><li>■ Relative humidity: 5% to 95% noncondensing</li><li>■ Maximum altitude: 10,000 feet</li><li>■ FCC Class A approved</li></ul>
Size and weight	1.73 inches (4.4 cm) high by 17.6 inches (44.7 cm) wide by 28 inches (71.1 cm) deep 26 pounds (11.8 kg); 31 pounds (14.1 kg) with four Apple Drive Modules <sup>5</sup>
Product contains electronic documentation. Backup copy of software is included. Xserve cluster configuration may require external optical drive or host system for software reinstallation.	

1. For hard drive capacity measurements, 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less. Maximum capacity of 720GB achieved through use of four 180GB Apple Drive Modules. Empty drive bays contain blank modules.
2. Specifications differ for Xserve cluster configuration. 3A
3. A separate AppleCare Premium Service and Support Plan must be purchased for each Xserve system to be covered. To qualify, your Xserve system must be within its one-year hardware warranty. Coverage ends three years after date of Xserve purchase. Actual onsite response time and availability of onsite service depend on location; see [www.apple.com/support/products/premium](http://www.apple.com/support/products/premium) for details. Local telephone fees may apply; telephone numbers may vary and are subject to change.
4. WebObjects Deployment, NetBoot for Mac OS 9 clients, and Macintosh Manager software not included with Xserve cluster configuration.
5. Weight varies by configuration and manufacturing process.

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# iPod with scroll wheel (5 and 10 GB) - Technical Specifications

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## iPod with scroll wheel (5 and 10 GB) - Technical Specifications

Technical Specifications	
<b>Capacity</b> <ul style="list-style-type: none"><li>5GB or 10GB hard disk drive<sup>1</sup><ul style="list-style-type: none"><li>Holds up to 1,000 or 2,000 songs in 160-Kbps MP3 format<sup>2</sup></li><li>Stores data in FireWire disk mode</li><li>Stores up to 1,000 contacts<sup>5</sup></li></ul></li></ul>	<b>Headphones</b> <ul style="list-style-type: none"><li>Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets</li><li>Frequency response: 20 to 20,000 Hz</li><li>Impedance: 32 ohms</li><li>Sensitivity: 104-dB sound pressure level at 1 mW</li></ul>
<b>Size and weight</b> <ul style="list-style-type: none"><li>Height: 4.02 inches (102 mm)</li><li>Width: 2.43 inches (61.8 mm)</li><li>Depth: 0.78 inch (19.9 mm)</li><li>Weight: 6.5 ounces (185 g)</li></ul>	<b>Display</b> <ul style="list-style-type: none"><li>2-inch (diagonal) liquid crystal display with white LED backlight</li><li>160-by-128-pixel resolution; 0.24-mm dot pitch</li><li>Support for display of multiple languages and characters simultaneously</li></ul>
<b>Input and output</b> <ul style="list-style-type: none"><li>FireWire (IEEE 1394a) port</li><li>3.5-mm stereo headphone jack</li></ul>	<b>Environmental requirements</b> <ul style="list-style-type: none"><li>Operating temperature: 32° to 95° F (0° to 35° C)</li><li>Nonoperating temperature: -4° to 113° F (-20° to 45° C)</li><li>Relative humidity: 5% to 95% noncondensing</li><li>Maximum operating altitude: 10,000 feet (3000 m)</li></ul>
<b>Power and battery</b> <ul style="list-style-type: none"><li>Built-in rechargeable lithium polymer battery (1200 mAh)</li><li>Playtime: 10 hours when fully charged</li><li>Charging via FireWire connector to Mac system or power adapter<ul style="list-style-type: none"><li>Fast-charge time: up to 1 hour (charges to 80% of battery capacity)</li><li>Full-charge time: up to 3 hours</li></ul></li></ul>	<b>Power adapter</b> <ul style="list-style-type: none"><li>6-pin FireWire connector</li><li>AC input: 100V to 240V at 0.4 amp maximum</li><li>Frequency: 50 to 60 Hz</li><li>DC output: 12V at 1 amp maximum</li></ul>
<b>Audio</b> <ul style="list-style-type: none"><li>Up to 20 minutes of skip protection</li><li>Maximum output power: 60 mW rms (30 mW per channel)</li><li>Frequency response: 20 to 20,000 Hz</li><li>Audio formats supported: MP3 (up to 320 Kbps), MP3 Variable Bit Rate (VBR), WAV, AIFF</li><li>Upgradable firmware enables support for future audio formats</li></ul>	
<b>Customizable settings</b> <ul style="list-style-type: none"><li>Equalizer</li><li>Shuffle songs or albums</li><li>Repeat one or all</li><li>Startup volume</li><li>Sleep timer</li><li>Backlight timer</li><li>Display contrast</li><li>Clicker</li><li>Languages: English, French, German, Japanese, Spanish, Italian, Dutch, Danish, Norwegian, Portuguese, Finnish, Swedish, Korean, Simplified Chinese, Traditional Chinese</li></ul>	
<b>Requirements</b> <ul style="list-style-type: none"><li>Apple computer with built-in FireWire port</li><li>Mac OS 9.2 (or later) or Mac OS X v10.1 (or later)</li><li>iTunes 2 software (included)</li></ul>	

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Capacity based on an average song length of 4 minutes and 160-Kbps encoding.

3. Battery life may vary according to use.

4. Actual rates will vary.

5. Contacts works with Mac OS X Address Book, Palm Desktop 4.0 or later, Microsoft Entourage for Mac OS X or Mac OS 9, and other applications that support industry-standard vCards (version 2.1 or 3.0).

6. You can order a custom laser-engraved iPod from the online Apple Store, Apple retail stores, or selected Apple authorized resellers.

# iMac (17-inch 1Ghz) - Technical Specifications

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## iMac (17-inch 1Ghz) - Technical Specifications

Configurations		
Order no.	M9105LL/A	M8935LL/A
Display	15-inch (viewable) TFT active-matrix LCD, 1024 by 768 pixels, millions of colors	17-inch (viewable) widescreen TFT active-matrix LCD, 1440 by 900 pixels, millions of colors
Processor	800MHz PowerPC G4	1GHz PowerPC G4
System bus	100MHz	133MHz
Memory	256MB of SDRAM; supports up to 1GB	256MB of PC2100 (266MHz) DDR SDRAM; supports up to 1GB
Hard drive (3)	60GB Ultra ATA/66 (7200 rpm)	80GB Ultra ATA/100 (7200 rpm)
Optical drive	32X Combo (DVD-ROM/CD-RW)	4X SuperDrive (DVD-R/CD-RW)
Graphics support	NVIDIA GeForce2 MX with 32 MB of DDR SDRAM	NVIDIA GeForce4 MX with 64 MB of DDR SDRAM
Ports	Two FireWire 400 ports, five USB ports (three on system, two on keyboard), mini-VGA output port, headphone jack, Apple speaker minijack, audio line in jack (17-inch model)	
VGA video mirroring	Yes(7)	Yes(7)
S-video and composite video output	No	Yes(7)
Networking	Built-in 10/100BASE-T Ethernet and 56K V.92 modem (4)	
Wireless	AirPort ready; Bluetooth via USB adapter (2)	AirPort Extreme ready(5); internal Bluetooth module available as a build-to-order option
System software	Mac OS X v10.2 Jaguar	
Software	iLife, including iTunes, iPhoto, iMovie and iDVD (requires SuperDrive (8)), Quicken 2003 Deluxe, World Book 2003 Edition, AppleWorks, Mac OS X Chess, Otto Matic, Deimos Rising, Sound Studio, FAXstf, QuickTime, iChat, iCal, iSync, DVD Player, Mail, Microsoft Internet Explorer, EarthLink, Acrobat Reader, Classic environment and Apple Developer Tools	
Hardware accessories	Apple Keyboard, Apple Mouse, Apple Pro Speakers, modem cable	
Limited Warranty and Service	Your iMac comes with 90 days of telephone support and a one-year limited warranty. Purchase theAppleCare Protection Plan and get three years of service and support. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	
Internet access	All models also include 30 days of free Internet service through EarthLink. Internet access requires a compatible Internet service provider; fees may apply.	

Build-to-Order Options	
Order a custom-configured computer from the online <a href="#">Apple Store</a> or an authorized Apple reseller.	
Memory	256MB, 512MB, 1GB (4)
Wireless	AirPort Card M7600LL/E (15-inch model) AirPort Extreme Card <a href="#">M8881LL/A</a> (17-inch model) AirPort Extreme Base Station M8930LL/A AirPort Extreme Base Station (with modem and antenna port) <a href="#">M8799LL/A</a> Internal Bluetooth module (17-inch model) <a href="#">T6295ZM/A</a>
Adapters and Cables	Apple Video Adapter <a href="#">M9109G/A</a> Apple VGA Display Adapter M8639G/A Apple FireWire Cable (4-pin to 6-pin) <a href="#">M8706G/A</a>
Services	AppleCare Protection Plan <a href="#">M8851LL/A</a> .Mac Subscription: Retail Box <a href="#">MA175Z/A</a> or Family Pack <a href="#">MA176Z/A</a>

# 104\_iMac (17-inch 1Ghz) - Technical Specifications.pdf

## Technical Specifications

### Processor and memory

- 800MHz or 1GHz PowerPC G4 processor with Velocity Engine
- 256K on-chip level 2 cache at full processor speed
- 100MHz or 133 Mhz system bus
- 17-inch model includes 256MB of PC2100 (266MHz) DDR SDRAM expandable to 1GB; one 184-pin DIMM and one open user-accessible SO-DIMM slot
- 15-inch model includes 256MB of SDRAM expandable to 1GB; one 168-pin DIMM and one open user-accessible SO-DIMM slot

### Storage

- 60GB or 80GB Ultra ATA 7200-rpm hard disk drive (3)
- One of the following optical drives:
  - Combo drive (DVD-ROM/CD-RW); reads DVDs at 8x speed, writes CD-R discs at 32x speed, writes CD-RW discs at 10x speed, reads CDs at 32x speed
  - SuperDrive (DVD-R/CD-RW); writes DVD-R discs at 4x speed, reads DVDs at 8x speed, writes CD-R discs at 16x speed, writes CD-RW discs at 8x speed, reads CDs at 32x speed

### Display

- Built-in 17-inch (viewable) widescreen or 15-inch (viewable) TFT active-matrix liquid crystal display
- Millions of colors at all resolutions
- Typical viewing angle: 120° horizontal; 90° vertical
- Typical brightness: 200 cd/m<sup>2</sup>
- Typical contrast ratio: 300:1

### Peripheral connections

- Two FireWire 400 ports; 8 watts shared
- Total of five USB 1.1 ports; three on computer (shared on two 12-Mbps controllers); two on keyboard

### Graphics support

- NVIDIA GeForce4 MX graphics processor with AGP 4X support or GeForce2 MX graphics processor with AGP 2X support
- 64MB or 32MB of dedicated Double Data Rate (DDR) video memory
- 17-inch display resolutions: 1440 by 900 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio
- 15-inch display resolutions: 1024 by 768 (native), 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio

### Communications

- Built-in 56K V.92 modem (RJ-11 connector) (4)
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and expansion slot for optional 54-Mbps AirPort Extreme Card (17-inch model) (5) or 11-Mbps AirPort Card (15-inch model) (2)
- Optional Bluetooth (requires Bluetooth adapter, sold separately; 17-inch model can be custom configured with internal Bluetooth module)

### Audio

- Built-in speaker
- Apple Pro Speakers (9 watts each)
- Apple Speaker minijack
- Internal 18-watt digital amplifier
- Headphone jack
- Audio line in jack (17-inch model)
- Built-in microphone

### Video

- Mini-VGA output port for video mirroring on external display or projector (requires Apple VGA Display Adapter, sold separately)
- S-video and composite video output to TV or projector (17-inch model; requires Apple Video Adapter, sold separately)
- Output resolutions: 640 by 480 pixels at 60Hz, 800 by 600 pixels at 75Hz, and 1024 by 768 pixels at 75Hz

### Electrical and environmental requirements

- Meets ENERGY STAR and TCO 95 requirements
- Line voltage: 90V to 264V AC
- Frequency: 47Hz to 63Hz, single phase
- Maximum continuous power: 160W (17-inch model); 130W (15-inch model)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet

### Size and weight (iMac with 17-inch display)

- Height: 13.03 inches (33.1 cm) minimum; 20.0 inches (50.9 cm) maximum
- Width: 16.7 inches (42.3 cm) minimum; 17.7 inches (44.9 cm) maximum
- Depth: 10.6 inches (27.0 cm) minimum; 16.7 inches (42.3 cm) maximum
- Diameter of base: 10.6 inches (27.0 cm)
- Weight: 22.8 pounds (10.4 kg)(6)

### Size and weight (iMac with 15-inch display)

- Height: 12.95 inches (32.9 cm) minimum; 20.0 inches (50.9 cm) maximum
- Width: 15.1 inches (38.4 cm) minimum; 16.3 inches (41.5 cm) maximum
- Depth: 10.6 inches (27.0 cm) minimum; 16.3 inches (41.5 cm) maximum
- Diameter of base: 10.6 inches (27.0 cm)
- Weight: 21.2 pounds (9.7 kg)(6)

(1) DVD burning requires SuperDrive.  
(2) Wireless Internet access requires AirPort Card or AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.  
(3) 1GB = 1 billion bytes; actual formatted capacity less.  
(4) Compatible ISP and telephone services required; fees may apply. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower.  
(5) Achieving data rates of 54 Mbps requires that all users have an AirPort Extreme Base Station and a computer with an AirPort Extreme Card. If a user of a Wi-Fi certified 802.11b product joins the network, that user will get up to 11 Mbps and AirPort Extreme users will get less than 54 Mbps. Actual speed will vary based on range, connection rate, site conditions, size of network, and other factors.  
(6) Weight varies by configuration and manufacturing process.  
(7) Requires adapter, sold separately.  
(8) iDVD included on SuperDrive-equipped systems.  
Internet access requires a compatible ISP; fees may apply.  
Product contains electronic documentation. Backup copy of software is included.  
Product specifications are subject to change without notice.

# iBook (Late 2001) - Technical Specifications

This article has been archived and is no longer updated by Apple.

Logic Board	Ports	Power
Processor: G3, 500 MHz	USB: 2 yes	Max Watts: 42
PMMU: integrated	ADB: n/a	Amps:
FPU: integrated	Video: AV port for composite video out, RGB video out port	BTU per Hr: 143.64
Data Path: 64-bit, 66 Mhz	Floppy: none	Voltage: 100-240
L1 Cache: 64 K	SCSI: none	Freq Range: 50-60 Hz
L2 Cache: 256 K	Geoports: none	Battery Type: 42 Wh Lithium Ion
2nd Processor: none	Ethernet: 10/100 Base-T	
Slots:	FireWire: 1	
	Mic: one	
	AirPort Ready: Yes	
	Other Ports: Speaker,	
	Sound Notes: Third party USB microphones and speakers are supported. 16-bit CD-quality stereo sound output minijack through AV port.	
Memory	Video Memory	
Logic Board: 128 MB	Video Memory	
RAM Slots: 1, SO-DIMM	Resolution (n/a)	
Min - Max RAM: 128 MB - 640 MB	512 x 384 n/a-bit	
Min RAM Speed: PC-100 spec	640 x 400 n/a-bit	
RAM Sizes: Up to 512 MB	640 x 480 24-bit	
Install in Groups of: 1	800 x 600 32-bit	
	832 x 624 n/a-bit	
	1024 x 768 24-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
	Notes: Supports 640- by 480 , 800- by 600, and 1024-by 768-pixel resolution with millions of colors. Uses ATI RAGE Mobility 128 graphics accelerator with 8MB of SDRAM graphics memory and AGP 2X support.	
Physical	Software	Storage
Introduced: 10/16/2001	Addressing Modes: 32-bit	Floppy Size: none
Discontinued: n/a	Orig SSW: 9.1	Floppy Inject: manual
Form Factor: iBook	Orig Enabler:	Min. Int HD Size: 15 GB
Gestalt ID:	ROM ID:	Int HD Interface: IDE
Weight (lbs): 4.9	ROM Ver:	Orig CD Speed: 24x
Dimensions (in): 9.1 H x 11.2 W x 1.35 D	ROM Size:	Int CD Support: yes
	AppleTalk Ver:	Notes: Optional DVD-ROM, CD-RW, or CD-RW/DVD-ROM Combo Drive.
	Mac OS Supported: 9 x	
	Notes: 128 MB of RAM recommended for Mac OS X.	

# Power Mac G4 (Mirrored Drive Doors 2003) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Power Mac G4 (Mirrored Drive Doors 2003) - Technical Specifications

Configurations	
Order Number	M9145
Processor	G4 1.25 GHz (single)
- L2 Cache	256 KB (1:1)
- L3 Cache	1 MB
Memory	256 MB
- Maximum	2 GB
- Slots	4 SDRAM (PC2700 - DDR333)
Hard Drive	80 GB
- Type (Speed)	Ultra ATA/100 (7200 rpm)
- Maximum Internal Drives	4
Optical Drive	Combo Drive (tray)
- DVD Decoding	software
- Read/Write	DVD-ROM read 8x, CD-ROM read 32x, CD-RW write 10x, CD-R write 16x
USB 1.1	2
FireWire 400	2
EtherNet (built-in)	1000Base-T
- Auto-MDIX	yes
Modem	v.92 (USB)
Wireless Networking	AirPort (optional)
Expansion Slots	4 PCI slots
Display	ATI Radeon 9000 Pro
- VRAM	64 MB DDR
- AGP	4x
- Max Resolution	Resolution (Digital): 1920x1200, Resolution (Analog): 1600x1200
Video External Connectors	ADC + DVI
Audio Line Out	yes
Audio Line In	yes
Speakers built-in	mono
Microphone (built-in)	no
Headphone	yes
Pro Speakers	yes
Accessories Included	Input Devices: Apple Pro (black), Video Adapters (Included): DVI to VGA Adapter
Software Included	OS: 10.2.4 / 9.2.2, Classic Support: 9.2.2 (bootable), OS Install/Restore: DVD (Install/Restore), Apple Hardware Test: Power Mac v2.0.2 (separate CD)
Size (Height/Width/Depth)	17.0" x 8.9" x 18.4" (43.2cm x 22.6cm x 46.7cm)
Weight	42 lbs. (19.1 kg)
Service and Support	90 days of free telephone support and one-year limited warranty

Published Date: Apr 6, 2016

# PowerBook G4 (Gigabit Ethernet) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (Gigabit Ethernet) - Technical Specifications

Logic Board	Ports	Power																		
Processor: G4, 550, 667MHz PMMU: integrated FPU: integrated Data Path: 64-bit, 100 MHz L1 Cache: 64K L2 Cache: 256K 2nd Processor: none Slots: One Type I or Type II PC Card	USB: 2 yes ADB: n/a Video: VGA Style Floppy: none SCSI: none Geoports: none Ethernet: 10/100/1000Base-T FireWire: 1 Mic Type: Built-in AirPort Ready: Yes Other Ports: Headphone,	Max Watts: 45 Amps: 1.2 BTU per Hr: 153.9 Voltage: 100-240V Freq Range: 50-60 Hz Hz Battery Type: 50 Watt Hr LiIon																		
Memory	Video Memory																			
Logic Board: none 2, PC133 SO-DIMM RAM Slots: Min - Max RAM: 128 MB - 1 GB Min RAM Speed: RAM Sizes: Up to 512 MB Install in Groups of: 1	Video Memory Built-in LCD (built-in) <table><tr><td>Resolution</td><td></td></tr><tr><td>512 x 384</td><td>n/a</td></tr><tr><td>640 x 400</td><td>n/a</td></tr><tr><td>640 x 480</td><td>n/a</td></tr><tr><td>800 x 600</td><td>n/a</td></tr><tr><td>832 x 624</td><td>n/a</td></tr><tr><td>1024 x 768</td><td>n/a</td></tr><tr><td>1152 x 870</td><td>n/a</td></tr><tr><td>1280 x 1024</td><td>n/a</td></tr></table> Notes: S-video and VGA video output ports		Resolution		512 x 384	n/a	640 x 400	n/a	640 x 480	n/a	800 x 600	n/a	832 x 624	n/a	1024 x 768	n/a	1152 x 870	n/a	1280 x 1024	n/a
Resolution																				
512 x 384	n/a																			
640 x 400	n/a																			
640 x 480	n/a																			
800 x 600	n/a																			
832 x 624	n/a																			
1024 x 768	n/a																			
1152 x 870	n/a																			
1280 x 1024	n/a																			
Physical	Software	Storage																		
Introduced: 10/16/2001 Discontinued: n/a Form Factor: PowerBook Gestalt ID: Weight (lbs): 5.3 Dimensions (in): 1 H x 13.4 W x 9.5 D	Addressing Modes: 32-bit Orig SSW: 9.2.1 Orig Enabler: n/a ROM ID: n/a ROM Ver: n/a ROM Size: AppleTalk Ver: n/a Mac OS Supported: 9.2.x X 10.1	Floppy Size: n/a Floppy Inject: manual Min. Int HD Size: 20 GB Int HD Interface: ATA Orig CD Speed: 24x Int CD Support: yes Notes: Uses slot loading DVD-ROM drive,CD-RW or DVD/CDRW drive																		



# Power Mac G4 (Quicksilver) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Power Mac G4 (Quicksilver) - Technical Specifications

Configurations			
Order no.	M8359LL/A	M8360LL/A	M8361LL/A
Processor	733-MHz PowerPC G4	867-MHz PowerPC G4	Dual 800-MHz PowerPC G4
On-chip cache	256K L2 at 733 MHz	256K L2 at 867 MHz	256K L2 at 800 MHz per processor
Backside cache	—	2MB L3 at 217 MHz	2MB L3 at 200 MHz per processor
Memory (PC133 SDRAM)	128MB	128MB	256MB
Hard disk drive <sup>6</sup>	40GB (5400 rpm)	60GB (7200 rpm)	80GB (7200 rpm)
Graphics support	NVIDIA GeForce2 MX with 32MB of SDRAM	NVIDIA GeForce2 MX with 32MB of SDRAM	NVIDIA GeForce2 MX with TwinView and 64MB of SDRAM <sup>5</sup>
Optical drive	CD-RW	SuperDrive (DVD-R/CD-RW)	SuperDrive (DVD-R/CD-RW)
FireWire	Two ports	Two ports	Two ports
USB	Two ports	Two ports	Two ports
PCI	Four slots	Four slots	Four slots
Ethernet	10/100/1000BASE-T	10/100/1000BASE-T	10/100/1000BASE-T
Wireless networking <sup>9</sup>	AirPort ready	AirPort ready	AirPort ready
Modem <sup>8</sup>	56K V.90	56K V.90	56K V.90

Options	
Processor	733-MHz, 867-MHz, dual 800-MHz PowerPC G4
Memory	128MB, 256MB, 384MB, 512MB, 768MB, 1GB, 1.5GB <sup>1</sup>
Hard disk drives	40GB Ultra ATA/66 (5400 rpm), 60GB Ultra ATA/66 (7200 rpm), 80GB Ultra ATA/66 (7200 rpm), 36GB Ultra160 SCSI (10,000 rpm), 72GB Ultra160 SCSI (10,000 rpm) <sup>6</sup>
Optical drives	CD-RW, combination DVD-ROM/CD-RW, SuperDrive (DVD-R/CD-RW)
Graphics	NVIDIA GeForce2 MX with 32MB of SDRAM, NVIDIA GeForce2 MX with TwinView and 64MB of SDRAM, <sup>5</sup> NVIDIA GeForce3 with 64MB of DDR RAM
Audio	Apple Pro Speakers, Harman Kardon iSub, Harman Kardon SoundSticks
Other	Zip 250 drive, Ultra SCSI PCI card, Ultra160 SCSI PCI card, AirPort Card, AirPort Base Station

## Technical Specifications

Processor

- 733- or 867-MHz PowerPC G4 processor; or dual 800-MHz PowerPC G4 processors
- Velocity Engine vector processing unit
- Full 128-bit internal memory data paths
- Powerful floating-point unit supporting single-cycle, double-precision calculations
- Data stream prefetching operations supporting four simultaneous 32-bit data streams
- 256K on-chip L2 cache running at processor speed
- 2MB backside L3 cache running at one-fourth the processor speed (867-MHz and dual 800-MHz systems)
- 133-MHz system bus supporting over 1-GBps data throughput

Memory

- 128MB or 256MB of PC133 SDRAM
- Three DIMM slots supporting up to 1.5GB of PC133 SDRAM using the following<sup>1</sup>:
  - 128MB or 256MB DIMMs (64-bit-wide, 128-Mbit technology)
  - 512MB DIMMs (64-bit-wide, 256-Mbit technology)

Storage

- One of the following hard disk drives<sup>6</sup>:
  - 40GB 5400-rpm Ultra ATA/66
  - 60GB 7200-rpm Ultra ATA/66
  - 80GB 7200-rpm Ultra ATA/66
- One of the following optical drives:
  - CD-RW drive (writes CD-R discs at 12x, writes CD-RW discs at 10x, reads CDs at 32x)
  - SuperDrive (combination DVD-R/CD-RW drive; writes DVD-R discs at 2x, reads DVDs at 4x, writes CD-R discs at 8x, writes CD-RW discs at 4x, reads CDs at 24x)
  - Combination DVD-ROM/CD-RW drive (build-to-order option; reads DVDs at 8x, writes CD-R discs at 8x, writes CD-RW discs at 8x, reads CDs at 32x)
- Three 3.5-inch hard drive expansion bays
  - One ATA drive preinstalled on standard configurations
  - Support for up to two internal ATA drives
  - Support for up to three internal SCSI drives
  - Support for a combination of internal SCSI and ATA drives (up to one ATA and two SCSI)

Graphics support

- One of the following graphics cards, installed in a dedicated AGP 4X graphics slot:
  - NVIDIA GeForce2 MX graphics card with 32MB of SDRAM
  - NVIDIA GeForce2 MX graphics card with TwinView and 64MB of SDRAM for dual display support<sup>5</sup>
  - NVIDIA GeForce3 graphics card with 64MB of Double Data Rate (DDR) RAM (build-to-order option)
- Support for up to 1920-by-1200-pixel resolution at 32 bits per pixel (millions of colors)
- Apple Display Connector (ADC)
- 15-pin VGA connector

Expansion

- Four full-length 64-bit, 33-MHz PCI slots
- One AGP 4X slot with graphics card installed
- Two 400-Mbps FireWire ports (15W total power)<sup>7</sup>
- Two USB ports (12 Mbps each; 24 Mbps total)

Communications

- 10/100/1000BASE-T Ethernet connector (RJ-45)
- Built-in 56K V.90 modem card<sup>8</sup>
- Optional 11-Mbps AirPort Card; IEEE 802.11 DSSS compliant<sup>9</sup>
- Optional AirPort Base Station containing 56K modem and 10BASE-T Ethernet port<sup>9</sup>

Audio

- Built-in speaker
- Apple speaker minijack (16 bit) for connection to Apple Pro Speakers
- Headphone jack (16 bit)
- Optional Apple Pro Speakers
- Support for external third-party USB digital audio peripherals such as microphones, speakers, and MIDI devices

Keyboard and mouse

- Apple Pro Keyboard
- Apple Pro Mouse

Electrical requirements and agency approvals

- Line voltage: 115V AC (90V to 132V AC) or 230V AC (180V to 264V AC)
- Frequency: 47 to 63 Hz, single phase
- Maximum continuous power: 360W
- Meets ENERGY STAR requirements

Environmental requirements

- Operating temperature: 50° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

Size and weight

- Height: 17.0 inches (43.2 cm)
- Width: 8.9 inches (22.6 cm)
- Depth: 18.4 inches (46.7 cm)
- Weight: 31 pounds (14.1 kg)<sup>10</sup>

1. 999MB maximum per application in Mac OS 9.  
2. DVD authoring in Mac OS X requires iDVD 2 and Mac OS X v10.1, available in late summer 2001; see [www.apple.com/macosx](http://www.apple.com/macosx) for details.  
3. Burning data CDs in Mac OS X requires Mac OS X v10.1, available in late summer 2001; see [www.apple.com/macosx](http://www.apple.com/macosx) for details.  
4. iTunes is licensed for reproduction of noncopyrighted materials or materials the user is legally permitted to reproduce.  
5. Dual display option supports one VGA display and one ADC display simultaneously.  
6. 1GB = 1 billion bytes; actual formatted capacity less.  
7. Actual rates will vary.  
8. Actual modem speeds lower; speed depends on connection rate and other factors.  
9. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort, including America Online. Range may vary with site conditions.  
10. Weight varies by configuration and manufacturing process.

# iMac (Summer 2001) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iMac (Summer 2001) - Technical Specifications

Configurations			
	iMac	iMac	iMac Special Edition
Order no.	M8582LL/A—Indigo M8490LL/A—Snow	M8492LL/A—Graphite M8546LL/A—Snow	M8510LL/A—Graphite M8554LL/A—Snow
Processor	500-MHz PowerPC G3	600-MHz PowerPC G3	700-MHz PowerPC G3
Level 2 cache	256K at 500 MHz	256K at 600 MHz	256K at 700 MHz
Memory (PC100 SDRAM)	128MB	256MB	256MB
Hard disk drive <sup>1</sup>	20GB Ultra ATA	40GB Ultra ATA	60GB Ultra ATA
Optical drive	CD-RW	CD-RW	CD-RW
Graphics support	ATI RAGE 128 Ultra with 16MB SDRAM	ATI RAGE 128 Ultra with 16MB SDRAM	ATI RAGE 128 Ultra with 16MB SDRAM
FireWire	Two ports	Two ports	Two ports
USB	Two ports (12 Mbps each)	Two ports (12 Mbps each)	Two ports (12 Mbps each)
VGA video mirroring	Yes	Yes	Yes
Fax modem <sup>2</sup>	56K V.90	56K V.90	56K V.90
Ethernet	10/100BASE-T	10/100BASE-T	10/100BASE-T
Wireless networking <sup>3</sup> AirPort ready AirPort ready AirPort ready			
All models include Apple Pro Keyboard; Apple Pro Mouse; FireWire camcorder cable; modem cable; Mac OS 9, Mac OS X, QuickTime, iMovie 2, iTunes, AppleWorks, Microsoft Internet Explorer, Microsoft Outlook Express, Netscape Communicator, Quicken Deluxe 2001, Palm Desktop, FAXstf, Cro-Mag Rally, Bugdom, and Nanosaur software; Apple Hardware Test CD; complete setup, learning, and reference documentation; limited warranty; and 30 days of free Internet service through EarthLink.			
Internet access requires an Internet service account. Product contains electronic documentation. Backup copy of software is provided on CD-ROM.			
Other Options			
Product		Order no.	
AirPort Card		M7600LL/B	
AirPort Base Station		M7601LL/B	
Technical Specifications			

**Processor and memory**

- 500-, 600-, or 700-MHz PowerPC G3 processor with 256K on-chip level 2 cache
- 100-MHz system bus
- 128MB or 256MB of PC100 SDRAM; two DIMM slots support up to 1GB using 128MB, 256MB, or 512MB DIMMs

**Storage**

- 20GB, 40GB, or 60GB Ultra ATA hard disk drive<sup>1</sup>
- Slot-loading 8x4x24x (maximum) CD-RW drive (writes CD-R discs at 8x speed, writes CD-RW discs at 4x speed, reads CDs at 24x speed)
- Support for external FireWire and USB storage devices

**Display**

- Built-in 15-inch shadow-mask CRT (13.8-inch diagonal viewable image size); 0.28-mm dot pitch
- Onscreen geometry adjustment to keep display images properly aligned throughout its lifetime
- Theater Mode for enhanced brightness of full-screen video using iMovie or QuickTime Player
- Flip foot for 17° tilt

**Graphics support**

- ATI RAGE 128 Ultra graphics accelerator with 16MB of SDRAM graphics memory; AGP 2X support
- Three crisp, flicker-free screen resolutions: 640 by 480 pixels at 117 Hz, 800 by 600 pixels at 95 Hz, and 1024 by 768 pixels at 75 Hz
- 24-bit true color at all resolutions for displaying millions of colors

**Communications**

- Built-in 56K V.90 fax modem (RJ-11 connector)<sup>2</sup>
- 10/100BASE-T Ethernet (RJ-45 connector)
- Support for optional 11-Mbps AirPort Card; IEEE 802.11 DSSS compliant<sup>3</sup>
- Support for optional AirPort Base Station with 56K fax modem and 10BASE-T Ethernet port<sup>3</sup>

**Peripheral connections**

- Two USB ports (12 Mbps each) on computer; two USB ports on keyboard
- Two 400-Mbps FireWire (IEEE 1394) ports<sup>5</sup>; includes 4-pin-to-6-pin FireWire cable for connecting DV camera

**Audio**

- Integrated high-performance Odyssey audio system by Apple and Harman Kardon
- Built-in microphone for speech recognition and audio recording
- Front-mounted dual mini headphone jacks (headphones not included)
- Analog audio input and output minijacks; up to 16-bit stereo and 44.1-kHz sampling rate
- Support for external USB audio devices

**Video**

- Standard VGA output port (15-pin mini D-Sub connector)
- Support for video mirroring: external devices display an image identical to that shown on the built-in display

**Keyboard and mouse**

- Apple Pro Keyboard with full-size function and navigation keys, audio controls, and CD-eject key
- Apple Pro Mouse with optical sensor for precise cursor control

**Electrical requirements and agency approvals**

- Line voltage: 100V to 260V AC
- Frequency: 47 to 63 Hz, single phase
- Maximum continuous power: 150W
- Meets ENERGY STAR requirements

**Environmental requirements**

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F ( -40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

**Size and weight**

- Height: 15.0 inches (38.1 cm)
- Width: 15.0 inches (38.1 cm)
- Depth: 17.1 inches (43.5 cm)
- Weight: 34.7 pounds (15.8 kg)

1. 1GB = 1 billion bytes; actual formatted capacity less.  
2. Actual modem speeds lower; speed depends on connection rate and other factors.  
3. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort, including America Online. Range may vary with site conditions.  
4. iTunes is licensed for reproduction of noncopyrighted materials or materials the user is legally permitted to reproduce.  
5. Actual rates will vary.

# Xserve (Early 2008) - Technical Specifications

This article has been archived and is no longer updated by Apple.

	Standard Configuration (MA882LL/A)	Build-to-Order Options
Processor	One 2.8GHz Quad-Core Intel Xeon 5400 series processor	Two 2.8GHz Quad-Core Intel Xeon 5400 series processors Two 3.0GHz Quad-Core Intel Xeon 5400 series processors
Memory	2GB (2x1GB) 800MHz DDR2 ECC fully buffered DIMMs	4GB (4x1GB) 800MHz DDR2 ECC fully buffered DIMMs 8GB (4x2GB) 800MHz DDR2 ECC fully buffered DIMMs 16GB (8x2GB) 800MHz DDR2 ECC fully buffered DIMMs 16GB (4x4GB) 800MHz DDR2 ECC fully buffered DIMMs 32GB (8x4GB) 800MHz DDR2 ECC fully buffered DIMMs
Storage	80GB 7200-rpm SATA Apple Drive Module with 8MB cache	80GB 7200-rpm SATA Apple Drive Module with 8MB cache 1TB 7200-rpm SATA Apple Drive Module with 32MB cache 73GB 15,000-rpm SAS Apple Drive Module with 16MB cache 300GB 15,000-rpm SAS Apple Drive Module with 16MB cache
Internal RAID	Optional	Xserve RAID Card with 256MB cache and 72-hour cache battery backup
Expansion	Optional	Dual-Channel Gigabit Ethernet PCI Express Card Dual-Channel 4Gb Fibre Channel PCI Express Card Quad-Channel 4Gb Fibre Channel PCI Express Card Dual-Channel U320 SCSI PCI-X Card
Power supply	Single 750W high-efficiency power supply	Dual redundant 750W high-efficiency power supplies
Rack support	Supports most industry-standard (EIA-310-D) four-post racks and cabinets with a rack depth of 24 inches to 36 inches deep; quick-deployment rails for square-hole racks eliminates need for cage nuts	Quick-deployment rails for threaded (10/32") racks
Service and support	90 days of telephone support and one-year limited warranty	Optional AppleCare extended service and support products available

- In the box
- Xserve
  - Rack mounting hardware
  - 6' and 10" power cords
  - Mini-DVI to VGA adapter
  - Mac OS X Server v10.5 Install DVD
  - Administration Tools CD
  - Printed and electronic documentation

- Processor
- One 2.8GHz or two 2.8GHz or 3.0GHz Quad-Core Intel Xeon 5400 series processors
  - Enhanced Intel Core microarchitecture
  - 12MB (2x6MB) on-die L2 cache per processor
  - Independent 1600MHz frontside bus per processor
  - 128-bit SSE4 SIMD engine
  - Energy efficiency optimization

- Memory
- 800MHz DDR2 ECC fully buffered DIMM (FB-DIMM) memory
  - Eight FB-DIMM slots support up to 32GB of memory
  - 256-bit-wide memory architecture

- Storage
- Three independent hot-plug drive bays with support for SATA or SAS drives; support for up to 3TB of hot-plug internal storage<sup>1,2</sup> using the following Apple Drive Modules:
    - 80GB 7200-rpm SATA with 8MB disk cache
    - 1TB 7200-rpm SATA with 32MB disk cache
    - 73GB 15,000-rpm SAS with 16MB disk cache
    - 300GB 15,000-rpm SAS with 16MB disk cache
  - Support for reading SMART data from Apple Drive Modules for prefailure notification
  - Software RAID 0 and 1 built into Mac OS X Server
  - Optional Xserve RAID Card with 256MB cache and 72-hour cache battery backup; support for RAID 0, 1, and 5
  - 8x double-layer SuperDrive (DVD+R DL/DVD±RW/CD-RW)

# 10\_Xserve (Early 2008) - Technical Specifications.pdf

## I/O connections

- Two open PCI Express 2.0 expansion slots: one half-length (6.6-inch) configurable slot (x8 PCI Express 2.0 or 133MHz PCI-X) and one 9.25-inch x16 PCI Express 2.0 slot
- Two independent 10/100/1000BASE-T (Gigabit) RJ-45 Ethernet interfaces with support for jumbo frames
- Built-in ATI Radeon X1300 PCI Express graphics board with 64MB of GDDR3 memory and single-link mini-DVI port; mini-DVI to VGA adapter included
- Two FireWire 800 ports on back panel; 15W total power
- Two USB 2.0 ports (480Mb/s each) on back panel; and one USB 2.0 port on front panel
- One DB-9 serial port (RS-232)

## Rack support

- Fits EIA-310-D-compliant, industry-standard four-post racks and cabinets: 19 inches wide, 24 to 36 inches deep
- Front-to-back cooling for rack enclosure
- Support for square-hole racks or threaded racks based on mounting kit selection

## Electrical requirements

- Output power: 750W
- Optional second load-sharing 750W power supply for redundancy
- Line voltage: universal input (100V to 240V AC), power factor corrected
- Maximum input current: 8.0A (100V to 120V) or 4.0A (200V to 240V); current is shared when system is configured with two power supplies
- Frequency: 50Hz to 60Hz, single phase

## Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- FCC Class A approved

## Size and weight

- Height: 1.73 inches (4.4 cm)
- Width: 17.6 inches (44.7 cm) for mounting in standard 19-inch rack
- Depth: 30 inches (76.2 cm)
- Weight: 31.7 pounds (14.4 kg) base configuration; 38.3 pounds (17.4 kg) for 8-core system with eight FB-DIMMs, three 300GB SAS Apple Drive Modules, and two power supplies<sup>3</sup>

## Software

- Mac OS X Server v10.5 Leopard Unlimited-client edition
- Included services
  - File and printer sharing: Mac (AFP, AppleTalk PAP, IPP), Windows (SMB/CIFS, IPP), UNIX and Linux (NFS, LPR/LPD), Internet (FTP, WebDAV)
  - Directory services: Open Directory (OpenLDAP, Kerberos, SASL), NT Domain Controller (Samba 3), Backup Domain Controller (BDC), LDAP directory connector, Active Directory connector, BSD configuration files (/etc), RADIUS
  - Mail services: SMTP (Postfix), POP and IMAP (Cyrus), SSL/TLS encryption (OpenSSL), mailing lists (Mailman), WebMail (SquirrelMail), junk mail filtering (SpamAssassin), virus detection and quarantine (ClamAV)
  - Calendaring: iCal Server (CalDAV, iTIP, iMIP)
  - Distributed computing: Xgrid 2
  - File systems: HFS+ (journaled, case sensitive), read-only UFS and ZFS
  - Web hosting: Apache web server (2.2 and 1.3), SSL/TLS (OpenSSL), WebDAV, PHP (5.2), Perl (5.8.8), Ruby (1.8.6), Rails (1.2.3), MySQL 5, Capistrano, Mongrel
  - Collaboration services: Wiki Server (RSS), iChat Server 2 (Jabber/XMPP)
  - Application services: Apache Tomcat (6), Java Virtual Machine (J2SE), Apache Axis (SOAP), WebObjects 5.4 Deployment
  - Client management: Managed Preferences, NetBoot, NetInstall, Software Update Server, Portable home directories
  - Networking and VPN: DNS server (BIND 9), DHCP server, NTP server, Firewall (IPFW), WINS, VPN server (L2TP, PPTP)
  - Management features: Server Assistant, Server Admin, Server Preferences, Server Status widget, Workgroup Manager, System Image Utility, Secure Shell (SSH2), Server Monitor, RAID Utility, SNMPv3 (Net-SNMP)
  - High-availability features: automatic recovery, file system journaling, IP failover, Software RAID, disk space monitor
  - Media streaming: QuickTime Streaming Server 6, QuickTime Broadcaster 1.5

## Xserve Accessories and Options

- Xserve RAID Card (MA689Z/B)
- 2GB 800MHz DDR2 FB-DIMM ECC 2x1GB (MB094G/A)
- 4GB 800MHz DDR2 FB-DIMM ECC 2x2GB (MB093G/A)
- 8GB 800MHz DDR2 FB-DIMM ECC 2x4GB (MB092G/A)
- Apple Drive Module 80GB SATA for Xserve (MB095G/A)
- Apple Drive Module 1TB SATA for Xserve (MB096G/A)
- Apple Drive Module 73GB SAS for Xserve (MB098G/A)
- Apple Drive Module 300GB SAS for Xserve (MB097G/A)
- Apple Dual-Channel 4Gb Fibre Channel PCI Express Card (MB355G/A)
- Apple Quad-Channel 4Gb Fibre Channel PCI Express Card (MB356G/A)
- Dual Channel Ultra320 SCSI PCI-X Card (MB099)
- Apple 750W Xserve Power Supply Kit (MB090LL/A)
- Xserve Rack Mounting Kit for Square Hole Racks (MA846G/A)
- Xserve Rack Mounting Kit for Threaded Hole Racks (MA847G/A)
- AppleCare Service Parts Kit for Xserve (MB086G/A)
- AppleCare Premium Service and Support for Xserve (M8830LL/C)

# 10\_Xserve (Early 2008) - Technical Specifications.pdf

1. For hard drive capacity measurements, 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
2. Maximum capacity of 3TB achieved through the use of three 1TB Apple Drive Modules.
3. Weight varies by configuration and manufacturing process.

Product specifications are subject to change without notice.

**Published Date:** Apr 6, 2016

# Apple Studio Display (17-inch, LCD) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Apple Studio Display 17 (LCD) - Technical Specifications

Technical Specifications	
<b>Screen size and type</b> <ul style="list-style-type: none"><li>17 inches (diagonal viewable image size)</li><li>Thin film transistor (TFT) active-matrix liquid crystal display</li></ul>	<b>Agency approvals</b> <ul style="list-style-type: none"><li>FCC Part 15 Class B</li><li>EN55022 Class B</li><li>EN55024</li><li>VCCI Class B</li><li>AS/NZS 3548 Class B</li><li>CNS 13438 Class B</li><li>ICES-003 Class B</li><li>ISO 13406</li><li>MPR II</li><li>IEC 60950</li><li>UL 60950</li><li>CSA 60950</li><li>EN60950</li><li>ENERGY STAR</li><li>TCO 95</li></ul>
<b>Display colors (maximum)</b> <ul style="list-style-type: none"><li>16.7 million</li></ul>	
<b>Viewing angle (typical)</b> <ul style="list-style-type: none"><li>160i horizontal; 160i vertical</li></ul>	
<b>Brightness (typical)</b> <ul style="list-style-type: none"><li>200 cd/m<sup>2</sup></li></ul>	
<b>Contrast ratio (typical)</b> <ul style="list-style-type: none"><li>350:1</li></ul>	
<b>Resolutions</b> <ul style="list-style-type: none"><li>1280 by 1024 pixels (optimum resolution)</li><li>1024 by 768 pixels</li><li>800 by 600 pixels</li><li>640 by 480 pixels</li></ul>	<b>Environmental requirements</b> <ul style="list-style-type: none"><li>Operating temperature: 50° to 95° F (10° to 35° C)</li><li>Storage temperature: -40° to 116° F (-40° to 47° C)</li><li>Operating humidity: 20% to 80%, noncondensing</li><li>Maximum operating altitude: 10,000 feet</li></ul>
<b>User controls (hardware and software)</b> <ul style="list-style-type: none"><li>System power on/sleep/wake</li><li>Brightness</li><li>Monitor tilt</li></ul>	<b>Size and weight</b> <ul style="list-style-type: none"><li>Height: 17.3 inches (43.9 cm)</li><li>Width: 17.6 inches (44.7 cm)</li><li>Depth: 6.9 inches (17.6 cm) minimum; 9.8 inches (24.9 cm) maximum</li><li>Weight: 14.6 pounds (6.6 kg)</li></ul>
<b>Screen treatment</b> <ul style="list-style-type: none"><li>Antiglare hardcoat</li></ul>	<b>System requirements</b> <ul style="list-style-type: none"><li>One of the following systems:<ul style="list-style-type: none"><li>Power Mac G4 with Apple Display Connector</li><li>Power Mac G4 with DVI port (via an ATI RAGE 128 Pro, ATI Radeon PCI, or NVIDIA GeForce4 Ti graphics card*) and Apple DVI to ADC Adapter</li><li>PowerBook G4 with DVI port and Apple DVI to ADC Adapter</li></ul></li></ul>
<b>Connectors and cables</b> <ul style="list-style-type: none"><li>Apple Display Connector carries digital video, USB, and power</li><li>Two-port, self-powered USB hub</li></ul>	
<b>Electrical requirements</b> <ul style="list-style-type: none"><li>Line voltage: 24.5V or 28V DC</li><li>Power: 40W (maximum) when operating; 5W or less when system is in energy saver mode</li></ul>	

\* NVIDIA GeForce4 Ti graphics card available in late May 2002.

Other Options	
Apple DVI to ADC Adapter	Order No. M8661LL/A



# iBook (Dual USB) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iBook (Dual USB) - Technical Specifications

Configurations			
Order no.	M7698LL/A	M7692LL/A	M8520LL/A
Processor	500-MHz PowerPC G3	500-MHz PowerPC G3	500-MHz PowerPC G3
Level 2 cache	256K at 500 MHz	256K at 500 MHz	256K at 500 MHz
Memory (PC100 SDRAM)	64MB	128MB	128MB
Hard disk drive <sup>2</sup>	10GB Ultra ATA	10GB Ultra ATA	10GB Ultra ATA
Optical drive	CD-ROM	DVD-ROM	DVD-ROM/CD-RW
Display	12.1-inch (diagonal) TFT XGA	12.1-inch (diagonal) TFT XGA	12.1-inch (diagonal) TFT XGA
Graphics support	ATI RAGE Mobility 128 with 8MB SDRAM	ATI RAGE Mobility 128 with 8MB SDRAM	ATI RAGE Mobility 128 with 8MB SDRAM
FireWire	One port	One port	One port
USB	Two ports	Two ports	Two ports
VGA and composite video output	Yes	Yes	Yes
Modem <sup>6</sup>	56K V.90	56K V.90	56K V.90
Ethernet	10/100BASE-T	10/100BASE-T	10/100BASE-T
Wireless networking <sup>5</sup>	AirPort ready	AirPort ready	AirPort ready
All models include a built-in keyboard and trackpad, modem cable, RGB display adapter, power adapter and power cord, and lithium-ion battery; Mac OS 9.1, Mac OS X,8 QuickTime, iMovie 2, iTunes, AppleWorks, Microsoft Internet Explorer, Microsoft Outlook Express, Netscape Communicator, Palm Desktop, FAXstf, Cro-Mag Rally, Bugdom, Nanosaur, and Acrobat Reader software; Apple Hardware Test CD; complete setup, learning, and reference documentation; limited warranty; and 30 days of free Internet service through EarthLink.			
Internet access requires an Internet service account. Most applications are preinstalled. Product contains electronic documentation. Backup copy of software is provided on CD-ROM.			
Options			
Product			Order no.
Apple Portable Power Adapter			M8457LL/A
iBook Rechargeable Battery			M8433G/A
AirPort Card			M7600LL/B
AirPort Base Station			M7601LL/B
Apple AV Cable			M8434G/A
Technical Specifications			

**Processor and memory**

- 500-MHz PowerPC G3 processor
- 256K on-chip level 2 cache
- 66-MHz system bus; 66-MHz memory bus
- 64MB of PC100 SDRAM, expandable to 576MB; or 128MB of PC100 SDRAM, expandable to 640MB; single 1.25-inch standard SO-DIMM slot supports up to 512MB SO-DIMM

**Storage**

- 10GB Ultra ATA hard disk drive<sup>2</sup>
- One of the following optical drives:
  - 24x-speed (maximum) CD-ROM drive (reads CD-ROM discs at 24x speed)
  - 8x-speed (maximum) DVD-ROM drive (plays DVDVideo discs; plays CD-ROM discs at 24x speed)
  - 4x4x6x24x-speed (maximum) DVD-ROM/CD-RW drive (writes CD-R discs at 4x speed; writes CD-RW discs at 4x speed; reads DVD-ROM discs at 6x speed; reads CD-ROM discs at 24x speed)
  - Optional 8x4x24x-speed (maximum) CD-RW drive (writes CD-R discs at 8x speed; writes CD-RW discs at 4x speed; reads CD-ROM discs at 24x speed)
- Support for external FireWire and USB storage devices

**Display**

- Built-in 12.1-inch (diagonal) TFT XGA active-matrix display
- Supports millions of colors at 1024-by-768-pixel resolution
- Supports resolution scaling to 800-by-600-pixel and 640-by-480-pixel resolution with millions of colors

**Graphics support**

- ATI RAGE Mobility 128 graphics accelerator with 8MB of SDRAM graphics memory and AGP 2X support

**Communications**

- Built-in 56K V.90 modem (RJ-11 connector)<sup>6</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and card slot for optional 11-Mbps AirPort Card; IEEE 802.11 DSSS compliant<sup>5</sup>
- Optional AirPort Base Station containing 56K modem and 10/BASE-T Ethernet port<sup>5</sup>

**Peripheral connections**

- Two 12-Mbps USB ports
- One 400-Mbps FireWire (IEEE 1394) port<sup>7</sup>

**Audio**

- 16-bit CD-quality stereo sound output minijack through AV port
- Built-in stereo speakers
- Built-in microphone
- Support for external USB audio devices such as microphones and speakers

**Video**

- VGA video output port for video mirroring with an external display or projector (24 bit)
- Composite video output to TV through AV port (requires Apple AV Cable)

**Battery and power**

- 42-watt-hour lithium-ion battery provides up to 5 hours of battery life on a single charge<sup>3</sup>
- Power adapter port

**Keyboard**

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded keypad

**Apple trackpad**

- Solid-state trackpad provides precise cursor control; supports tap, double-tap, and drag capabilities

**Electrical requirements**

- Line voltage: 100V to 240V AC
- Frequency: 50 to 60 Hz
- Meets ENERGY STAR requirements under Mac OS 9

**Environmental requirements**

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 140° F (–25° to 60° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

**Size and weight**

- Width: 11.2 inches (28.5 cm)
- Depth: 9.1 inches (23.0 cm)
- Thickness: 1.35 inches (3.4 cm)
- Weight: 4.9 pounds (2.2 kg)<sup>1</sup>

1. Weight varies by configuration.  
2. For hard drive capacity measurements, 1GB = 1 billion bytes; actual formatted capacity less.  
3. Battery life depends on configuration and use.  
4. iTunes is licensed for reproduction of noncopyrighted materials or materials the user is legally permitted to reproduce.  
5. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort, including America Online. Range may vary with site conditions.  
6. Actual modem speeds lower; speed depends on connection rate and other factors.  
7. Actual rates will vary.  
8. Mac OS X requires 128MB of SDRAM.

# iMac (Early 2001) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iMac (Early 2001) - Technical Specifications

Configurations	iMac	iMac	iMac Special Edition
Configurations	M7683LL/A—Indigo	M7669LL/A—Indigo M8347LL/A—Blue Dalmatian M8348LL/A—Flower Power	M7680LL/A—Graphite M7675LL/A—Blue Dalmatian M7679LL/A—Flower Power
Processor	400 MHz G3	500 MHz G3	600 MHz G3
- L2 Cache	512K at 160 MHz	256K at 500 MHz	256K at 600 MHz
Memory (PC100 SDRAM)	64MB	64MB	128MB
- Maximum	1 GB		
- Slots	2 DIMM		
Hard Drive	10GB Ultra ATA	20GB Ultra ATA	40GB Ultra ATA
Optical Drive	CD-ROM	CD-RW	CD-RW
- CD-ROM	24x read		
- CD-RW	24x read		
- CD-R	8x write		
- CD-RW	4x write, 24x read		
USB	2 ports (12Mbps each)		
FireWire	2 ports		
Expansion Slots	3 PCI slots (64-bit, 33 MHz)	3 PCI slots (Slots 2&3 64-bit, 100 MHz; Slot 4 64-bit, 133 MHz)	
EtherNet (built-in)	10/100 Base-T		
Modem <sup>(2)</sup>	56K V.90		
Wireless Networking	AirPort ready		
Video Card	ATI RAGE 128 Pro with 8MB SDRAM	ATI RAGE 128 Ultra with 16MB SDRAM	
- video bus	AGP (2x)		
- Max Resolution (Analog)	1024 x 768 at 75 Hz		
Video External Connectors	Standard VGA output port (15-pin mini D-Sub connector)		
Mirroring Supported	yes		
Microphone (Built-in)	yes		
Audio Line In	16-bit stereo and 44.1 kHz sampling rate		
Audio Line Out	Integrated high-performance Odyssey audio system by Apple and Harmon Kardon		
USB External Audio Support	yes		
Headphone Jacks	yes (2 front)		
Accessories Included	Apple Pro Keyboard; Apple Pro Mouse; FireWire camcorder cable; modem cable		
Software Included	Mac OS 9.1, QuickTime, iMovie 2, iTunes <sup>(4)</sup> , AppleWorks, Microsoft Internet Explorer, Microsoft Outlook Express, Netscape Communicator, Quicken Deluxe 2001, Palm Desktop, FAXstf, Cro-Mag Rally, Bugdom, and Nanosaur software; Apple Hardware Test CD		
Size (Height/Width/Depth)	15.0" x 15.0" x 17.1" (38.1cm x 38.1cm x 43.5cm)		
Weight	34.7 lbs. (15.8 kg)		

Build-to-Order Options	Order a custom-configured eMac from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Memory	64MB - 1GB
Hard Drive <sup>(2)</sup>	Up to 40GB Ultra ATA
Wireless	Airport

### Technical Specifications

# 112\_iMac (Early 2001) - Technical Specifications.pdf

## Processor and memory

- 400-, 500-, or 600-MHz PowerPC G3 processor
- 512K backside level 2 cache (400-MHz system); or 256K on-chip level 2 cache (500-MHz and 600-MHz systems)
- 100-MHz system bus
- 64MB or 128MB of PC100 SDRAM; two DIMM slots support up to 1GB using 64MB, 128MB, 256MB, or 512MB DIMMs

## Storage

- 10GB, 20GB, or 40GB Ultra ATA hard disk drive <sup>(1)</sup>
- Slot-loading 24x (maximum) CD-ROM drive (reads CD at 24x speed); or 8x4x24x (maximum) CD-RW drive (writes CD-R at 8x speed, writes CD-RW at 4x speed, reads CD at 24x speed)
- Support for external FireWire and USB storage devices

## Display

- Built-in 15-inch shadow-mask CRT (13.8-inch diagonal viewable image size); 0.28-mm dot pitch
- Onscreen geometry adjustment to keep display images properly aligned throughout its lifetime
- Theater Mode for enhanced brightness of full-screen video using iMovie or QuickTime Player
- Flip foot for 17° tilt

## Graphics support

- ATI RAGE 128 Pro graphics accelerator with 8MB of SDRAM graphics memory or ATI RAGE 128 Ultra graphics accelerator with 16MB of SDRAM graphics memory; AGP 2X support
- Three crisp, flicker-free screen resolutions: 640 by 480 pixels at 117 Hz, 800 by 600 pixels at 95 Hz, and 1024 by 768 pixels at 75 Hz
- 24-bit true color at all resolutions for displaying millions of colors

## Communications

- Built-in 56K V.90 modem (RJ-11 connector) <sup>(2)</sup>
- 10/100BASE-T Ethernet (RJ-45 connector)
- Optional 11-Mbps AirPort Card; IEEE 802.11 DSSS compliant <sup>(3)</sup>
- Optional AirPort Base Station with 56K modem and 10BASE-T Ethernet port <sup>(3)</sup>

## Peripheral connections

- Two USB ports (12 Mbps each) on computer; two USB ports on keyboard
- Two 400-Mbps FireWire (IEEE 1394) ports <sup>(6)</sup>; includes 4-pin-to-6-pin FireWire cable for connecting DV camera

## Audio

- Integrated high-performance Odyssey audio system by Apple and Harman Kardon
- Built-in microphone for speech recognition and audio recording
- Front-mounted dual mini headphone jacks (headphones not included)
- Analog audio input and output minijacks; up to 16-bit stereo and 44.1-kHz sampling rate
- Support for external USB audio devices

## Video

- Standard VGA output port (15-pin mini D-Sub connector)
- Support for video mirroring: external devices display an image identical to that shown on the built-in display

## Keyboard and mouse

- Apple Pro Keyboard with full-size function and navigation keys, audio controls, and media-eject key
- Apple Pro Mouse with optical sensor for precise cursor control

## Electrical requirements and agency approvals

- Line voltage: 100V to 260V AC
- Frequency: 47 to 63 Hz, single phase
- Maximum continuous power: 150W
- U.S. EPA ENERGY STAR compliant

## Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Size and weight

- Height: 15.0 inches (38.1 cm)
- Width: 15.0 inches (38.1 cm)
- Depth: 17.1 inches (43.5 cm)
- Weight: 34.7 pounds (15.8 kg)

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Actual modem speeds lower; speed depends on connection rate and other factors.

3. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort, including America Online. Range may vary with site conditions.

4. iTunes may require Internet download; Internet access fees may apply. iTunes is licensed for reproduction of noncopyrighted materials or materials the user is legally permitted to reproduce.

5. CD-RW drive included in 500- and 600-MHz iMac systems.

6. Actual rates will vary.

# Power Mac G4 (Digital Audio) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Power Mac G4 (Digital Audio) - Technical Specifications

Configurations				
Order no.	M7627LL/A	M7688LL/A	M8451LL/A	M7681LL/A
Processor	466-MHz PowerPC G4	533-MHz PowerPC G4	733-MHz PowerPC G4	733-MHz PowerPC G4
On-chip cache	—	—	256K L2 at 733 MHz	256K L2 at 733 MHz
Backside cache	1MB L2 at 233 MHz	1MB L2 at 266 MHz	1MB L3 at 183 MHz	1MB L3 at 183 MHz
Memory	128MB	128MB	256MB	256MB
Hard disk drive <sup>5</sup>	30GB (5400 rpm)	40GB (7200 rpm)	60GB (7200 rpm)	60GB (7200 rpm)
Graphics support	ATI RAGE 128 Pro with 16MB of SDRAM	NVIDIA GeForce2 MX with 32MB of SDRAM	NVIDIA GeForce2 MX with 32MB of SDRAM	NVIDIA GeForce2 MX with 32MB of SDRAM
Optical drive	CD-RW	CD-RW	CD-RW	DVD-R/CD-RW
FireWire <sup>3</sup>	Two 400-Mbps ports	Two 400-Mbps ports	Two 400-Mbps ports	Two 400-Mbps ports
USB	Two ports	Two ports	Two ports	Two ports
Ethernet	10/100/1000BASE-T	10/100/1000BASE-T	10/100/1000BASE-T	10/100/1000BASE-T
Wireless networking <sup>4</sup>	56K V.90	56K V.90	56K V.90	56K V.90

Options	
<b>Processor</b>	466-MHz, 533-MHz, dual 533-MHz PowerPC G4
<b>Memory</b>	128MB, 256MB, 384MB, 512MB, 768MB, 1GB, 1.5GB <sup>1</sup>
<b>Hard disk drives</b>	30GB Ultra ATA/66 (5400 rpm), 40GB Ultra ATA/66 (7200 rpm), 60GB Ultra ATA/66 (7200 rpm), 36GB Ultra160 SCSI (10,000 rpm), 72GB Ultra160 SCSI (10,000 rpm) <sup>5</sup>
<b>Optical drives</b>	CD-RW, DVD-ROM
<b>Graphics</b>	ATI RAGE 128 Pro with 16MB of SDRAM, NVIDIA GeForce2 MX with 32MB of SDRAM, ATI RADEON with 32MB of DDR RAM, NVIDIA GeForce3 with 64MB of DDR RAM
<b>Audio</b>	Apple Pro Speakers, Harman Kardon iSub, Harman Kardon SoundSticks
<b>Other</b>	Zip 250 drive, SCSI PCI card, Ultra160 SCSI PCI card, AirPort Card, AirPort Base Station

Technical Specifications
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Processor

- 466-, 533-, or 733-MHz PowerPC G4 processor; or dual 533-MHz PowerPC G4 processors
- Velocity Engine vector processing unit
- Full 128-bit internal memory data paths
- Powerful floating-point unit supporting single-cycle, double-precision calculations
- Data stream prefetching operations supporting four simultaneous 32-bit data streams
- 256K on-chip level 2 cache running at processor speed, plus 1MB backside level 3 cache running at one-fourth the processor speed (733-MHz systems)
- 1MB backside level 2 cache running at half the processor speed (466-MHz and 533-MHz systems)
- 133-MHz system bus supporting over 1-GBps data throughput

Memory

- 128MB or 256MB of PC133 SDRAM
- Three DIMM slots support up to 1.5GB of PC133 SDRAM using the following<sup>1</sup>:
  - 32MB, 64MB, or 128MB DIMMs (64-bit-wide, 64-Mbit technology)
  - 128MB or 256MB DIMMs (64-bit-wide, 128-Mbit technology)
  - 512MB DIMMs (64-bit-wide, 256-Mbit technology)

Storage<sup>5</sup>

- One of the following hard disk drives:
  - 30GB 5400-rpm Ultra ATA/66
  - 40GB 7200-rpm Ultra ATA/66
  - 60GB 7200-rpm Ultra ATA/66
- One of the following optical drives:
  - CD-RW drive (writes CD-R at 8x, writes CD-RW at 4x, reads CD at 32x)
  - Combination DVD-R/CD-RW drive (writes DVD-R at 2x, reads DVD at 6x, writes CD-R at 8x, writes CD-RW at 4x, reads CD at 24x)
- Three 3.5-inch hard disk drive expansion bays:
  - One ATA drive preinstalled on standard configurations
  - Support for up to two internal ATA drives
  - Support for up to three internal SCSI drives
  - Support for a combination of internal SCSI and ATA drives (up to one ATA and two SCSI)
- Optional Zip 250 drive

Expansion

- Four full-length 64-bit, 33-MHz PCI slots
- One AGP 4X slot with graphics card installed
- Two 400-Mbps FireWire ports (15W total power)<sup>3</sup>
- Two USB ports (12 Mbps each)

Graphics support

- ATI RAGE 128 Pro graphics card with 16MB of SDRAM graphics memory or NVIDIA GeForce2 MX graphics card with 32MB of SDRAM; installed in a dedicated AGP 4X graphics slot
- Optional ATI RADEON graphics card with 32MB of Double Data Rate (DDR) RAM
- Optional NVIDIA GeForce3 graphics card with 64MB of DDR RAM
- Support for up to 1920-by-1200-pixel resolution at 32 bits per pixel (millions of colors)
- Apple Display Connector (ADC)
- 15-pin mini D-Sub VGA connector

Communications

- 10/100/1000BASE-T Ethernet connector (RJ-45)
- Built-in 56K V.90 modem card<sup>6</sup>
- Optional 11-Mbps AirPort Card; IEEE 802.11 DSSS compliant<sup>4</sup>
- Optional AirPort Base Station containing 56K modem and 10BASE-T Ethernet port<sup>4</sup>

Audio

- Apple speaker minijack (16 bit) for connection to Apple Pro Speakers
- Headphone jack (16 bit)
- Optional Apple Pro Speakers
- Support for external third-party USB digital audio peripherals such as microphones, speakers, and MIDI devices

Keyboard and mouse

- Apple Pro Keyboard
- Apple Pro Mouse

Electrical requirements and agency approvals

- Line voltage: 115V AC (90V to 132V AC) or 230V AC (180V to 264V AC)
- Frequency: 47 to 63 Hz, single phase
- Maximum continuous power: 338W
- U.S. EPA ENERGY STAR compliant

Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Altitude: 0 to 10,000 feet

Size and weight

- Height: 17.0 inches (43.2 cm)
- Width: 8.9 inches (22.6 cm)
- Depth: 18.4 inches (46.7 cm)
- Weight: 30 pounds (13.6 kg)<sup>7</sup>

1. 999MB maximum per application in Mac OS 9.  
2. iTunes may require Internet download; Internet access fees may apply. iTunes is licensed for reproduction of noncopyrighted materials or materials the user is legally permitted to reproduce.  
3. Actual rates will vary.  
4. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort, including America Online. Range may vary with site conditions.  
5. For hard drive capacity measurements, 1GB = 1 billion bytes; actual formatted capacity less.  
6. Actual modem speeds lower.  
7. Weight varies by configuration and manufacturing process.

# PowerBook G4 - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 - Technical Specifications

Configurations		
Order no.	M7952LL/A	M7710LL/A
Processor	400-MHz PowerPC G4	500-MHz PowerPC G4
Backside level 2 cache	1MB	1MB
Memory (PC100 SDRAM)	128MB	256MB
Display	15.2-inch (diagonal) TFT	15.2-inch (diagonal) TFT
Video memory (SDRAM)	8MB	8MB
Video controller	ATI RAGE Mobility 128	ATI RAGE Mobility 128
Hard disk drive <sup>4</sup>	10GB Ultra ATA/66	20GB Ultra ATA/66
Optical drive	Slot-loading DVD-ROM with DVD-Video playback	Slot-loading DVD-ROM with DVD-Video playback
Ethernet	Built-in 10/100BASE-T	Built-in 10/100BASE-T
Modem <sup>7</sup>	56K V.90	56K V.90
Wireless networking <sup>6</sup>	AirPort ready	AirPort ready

Options	
Product	Order no.
PowerBook G4 Rechargeable Battery	M8244G/A
Apple Portable Power Adapter	M8457LL/A
AirPort Card	M7600LL/B
AirPort Base Station	M7601LL/B

Technical Specifications
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# 114\_PowerBook G4 - Technical Specifications.pdf

### Processor and memory

- 400- or 500-MHz PowerPC G4 processor with Velocity Engine
- 1MB backside level 2 cache on processor module; 200- or 250-MHz dedicated 64-bit backside bus
- 100-MHz system bus
- Integrated floating-point unit and 64K on-chip level 1 cache (32K data and 32K instruction)
- 128MB or 256MB of PC100 SDRAM; two SO-DIMM slots support up to 1GB

### Storage

- Internal 10GB, 20GB, or 30GB Ultra ATA/66 hard disk drive (30GB drive available in build-to-order computers)<sup>4</sup>
- Slot-loading DVD-ROM drive reads DVD-ROM, DVD-Video, DVD-RAM, and CD-ROM discs

### Communications

- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in 56K V.90 modem (RJ-11 connector)<sup>7</sup>
- Optional 11-Mbps AirPort Card (IEEE 802.11 DSSS compliant)<sup>5</sup>
- Infrared technology port (4-Mbps IrDA)

### Expansion

- One 400-Mbps FireWire (IEEE 1394) port<sup>8</sup>
- Two 12-Mbps USB ports
- One PC Card and CardBus slot
  - Support for one Type I or Type II PC Card or CardBus card
  - Support for a Zoom Video PC Card

### Video and graphics support

- 8MB of SDRAM video memory supports millions of colors on external monitors up to 21 inches
- Built-in 2D/3D graphics acceleration through an integrated ATI RAGE Mobility 128 video controller with AGP 2X
- 24-bit video output port (VGA-style connector)
- S-video output port
- S-video to composite adapter

### Display

- 15.2-inch (diagonal) built-in TFT widescreen activematrix display
  - Supports millions of colors at 1152-by-768-pixel resolution
  - Supports resolutions of 1152 by 768, 896 by 600, and 720 by 480 pixels at 3:2 aspect ratio
  - Supports resolutions of 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio

### Audio

- 16-bit CD-quality stereo output (minijack)
- Two built-in stereo speakers
- Internal omnidirectional microphone

### Battery and power

- 50-watt-hour lithium-ion battery with integrated charge indicator LEDs provides up to 5 hours of battery life<sup>3</sup>
- Power adapter with cable management system
- Power adapter port

### Security

- Kensington cable lock slot
- Keyboard lock

### Keyboard

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted OTU arrangement), and embedded keypad

### Apple trackpad

- Solid-state trackpad provides precise cursor control; supports tap, double-tap, and drag capabilities

### Electrical requirements

- Line voltage: 100V to 240V AC
- Frequency: 50 to 60 Hz

### Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –40° to 116° F (–47° to 47° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

### Size and weight

- Height: 1.0 inches (2.6 cm)
- Width: 13.4 inches (34.1 cm)
- Depth: 9.5 inches (24.1 cm)
- Weight: 5.3 pounds (2.4 kg) with battery installed<sup>1</sup>

1. Weight varies by configuration and manufacturing process.  
2. Based on Adobe Photoshop tests comparing a 500-MHz PowerBook G4 to 850-MHz Pentium III-based portable computers.  
3. Battery life depends on configuration and use.  
4. For hard drive capacity measurements, 1GB = 1 billion bytes; actual formatted capacity less.  
5. iTunes is licensed for reproduction of noncopyrighted materials or materials the user is legally permitted to reproduce.  
6. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort, including America Online. Range may vary with site conditions.  
7. Actual modem speeds lower; speed depends on connection rate and other factors.  
8. Actual rates will vary.



# iBook (FireWire) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iBook (FireWire) - Technical Specifications

Configurations		
Order no.	iBook M7721LL/A—Indigo	iBook Special Edition M7720LL/A—Graphite
Processor	366-MHz PowerPC G3	466-MHz PowerPC G3
Level 2 cache	256K at 366 MHz	256K at 466 MHz
Memory (PC100 SDRAM)	64MB	64MB
Hard disk drive <sup>1</sup>	10GB Ultra ATA	10GB Ultra ATA
Optical drive	CD-ROM drive	DVD-ROM drive
Display	12.1-inch TFT SVGA	12.1-inch TFT SVGA
FireWire	One port	One port
USB	One port	One port
Composite video output	Yes	Yes
Modem <sup>4</sup>	56K V.90	56K V.90
Ethernet	10/100BASE-T	10/100BASE-T
Wireless networking <sup>3</sup>	Airport ready	airport ready

All models include a built-in keyboard and trackpad; modem cable; power adapter and power cord; lithium-ion battery; Mac OS 9, QuickTime, AppleWorks, iMovie 2, Microsoft Internet Explorer, Microsoft Outlook Express, Netscape Communicator, Palm Desktop, FAXstf, Bugdom, Nanosaur, and Acrobat Reader software; complete setup, learning, and reference documentation; limited warranty; and 30 days of free Internet service through EarthLink.

Internet access requires an Internet service account. Most applications are preinstalled. Some applications require the use of an included CD-ROM. Product contains electronic documentation. Backup software is provided on CD-ROM.

Other Options	
Product	Product Order no.
iBook Power Adapter	M7387LL/A
iBook Battery	M7621G/B
AirPort Card	M7600LL/B
AirPort Base Station	M7601LL/B

## Technical Specifications

# 115\_iBook (FireWire) - Technical Specifications.pdf

## Processor and memory

- 366- or 466-MHz PowerPC G3 processor
- 256K on-chip level 2 cache
- 66-MHz system bus; 66-MHz memory bus
- 64MB of PC100 SDRAM; single 1.35-inch standard SO-DIMM slot (3.3 volt) supports up to 256MB SO-DIMM for a total of 320MB of SDRAM

## Storage

- 10GB Ultra ATA hard disk drive<sup>1</sup>
- 24x-speed (maximum) CD-ROM drive; or 6x-speed (maximum) DVD-ROM drive (plays DVD-Video discs; plays CD-ROMs at up to 24x speed)
- Support for external FireWire and USB storage devices

## Display

- Built-in 12.1-inch (diagonal) TFT SVGA active-matrix display
- Supports millions of colors at 800- by 600-pixel resolution
- Supports resolution scaling to 640- by 480-pixel resolution with millions of colors

## Graphics support

- ATI RAGE Mobility 128 graphics accelerator with 8MB of SDRAM graphics memory and AGP 2X support

## Communications

- Built-in 56K V.90 modem (RJ-11 connector)<sup>4</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Optional 11-Mbps AirPort Card; IEEE 802.11 DSSS compliant<sup>3</sup>
- Optional AirPort Base Station containing 56K modem and 10/BASE-T Ethernet port<sup>3</sup>

## Peripheral connections

- One 12-Mbps USB port
- One 400-Mbps FireWire (IEEE 1394) port<sup>5</sup>

## Audio

- 16-bit CD-quality stereo sound output minijack through AV port
- Single built-in mono speaker
- Support for external USB audio devices such as microphones and speakers

## Video

- Composite video output to TV through AV port

## Battery and power

- 50-watt-hour lithium-ion battery
- Up to 6 hours of battery life on a single charge<sup>2</sup>
- Power adapter port

## Keyboard

- Built-in full-size keyboard with 76 (U.S.) or 77 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement), and embedded keypad

## Apple trackpad

- Solid-state trackpad provides precise cursor control; supports tap, double-tap, and drag capabilities

## Electrical requirements

- Line voltage: 100V to 240V AC
- Frequency: 50 to 60 Hz
- U.S. EPA ENERGY STAR compliant

## Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 140° F (–25° to 60° C)
- Relative humidity: 20% to 80% noncondensing
- Operating altitude: 0 to 10,000 feet (0 to 3,048 m)
- Maximum storage altitude: 15,000 feet (4,572 m)

## Size and weight

- Width: 13.5 inches (34.4 cm)
- Height: 11.6 inches (29.4 cm)
- Average depth: 1.8 inches (4.6 cm); depth ranges from 1.24 inches (3.15 cm) at the thinnest point to 2.06 inches (5.2 cm) at the thickest point
- Weight: iBook—6.6 pounds (3.0 kg); iBook Special Edition—6.8 pounds (3.1 kg)

- 
1. For hard drive capacity measurements, 1GB = 1 billion bytes; actual formatted capacity less.
  2. Battery life depends on configuration and use.
  3. Wireless Internet access requires AirPort Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort, including America Online. Range may vary with site conditions.
  4. Actual modem speeds lower; speed depends on connection rate and other factors.
  5. Actual rates will vary.

Published Date: Apr 6, 2016

# Power Mac G4 (Cube) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Power Mac G4 (Cube) - Technical Specifications

Options	
Processor	450-MHz or 500-MHz PowerPC G4
Memory	128MB, 256MB, 384MB, 512MB, 768MB, 1GB, or 1.5GB <sup>2</sup>
Graphics	ATI RAGE 128 Pro with 16MB of SDRAM, NVIDIA GeForce2 MX with 32MB of SDRAM, or ATI RADEON with 32MB of DDR RAM
Hard disk drives	20GB Ultra ATA/66 (5400 rpm), 40GB Ultra ATA/66 (5400 rpm), or 60GB Ultra ATA/66 (7200 rpm) <sup>3</sup>
Optical drives	CD-RW or DVD-ROM
Communications	AirPort Card, AirPort Base Station
Audio	Harman Kardon SoundSticks speakers and subwoofer

Technical Specifications	
<b>Processor</b> <ul style="list-style-type: none"><li>450-MHz PowerPC G4 processor</li><li>Velocity Engine vector processing unit</li><li>Full 128-bit internal memory data paths</li><li>Powerful floating-point unit supporting single-cycle, double-precision calculations</li><li>Data stream prefetching operations supporting four simultaneous 32-bit streams</li><li>1MB backside level 2 cache running at 225 MHz</li><li>100-MHz system bus supporting up to 800-Mbps data throughput</li></ul>	<b>Speakers and audio</b> <ul style="list-style-type: none"><li>Digital amplifier and speakers with Harman Kardon audio technology<ul style="list-style-type: none"><li>—Total power output: 20W</li><li>—Frequency response: 80 Hz to 20 kHz</li><li>—Single USB cable carries both power and audio; plugs into USB port on the G4 Cube or a display with ADC</li><li>—Removable covers protect speaker cones</li><li>—Digital amplifier module includes locking loop for theft prevention and minijack for connecting stereo headphones</li></ul></li><li>Support for external third-party FireWire and USB digital audio peripherals such as microphones, speakers, and MIDI devices</li></ul>
<b>Memory</b> <ul style="list-style-type: none"><li>128MB of PC100 SDRAM</li><li>Three DIMM slots support up to 1.5GB of PC100 SDRAM2 using up to 1.38-inch (35-mm) DIMMs, as follows:<ul style="list-style-type: none"><li>—32MB, 64MB, or 128MB DIMMs (64-bit-wide, 64-Mbit technology)</li><li>—128MB or 256MB DIMMs (64-bit-wide, 128-Mbit technology)</li><li>—512MB DIMMs (64-bit-wide, 256-Mbit technology)</li></ul></li></ul>	<b>Keyboard and mouse</b> <ul style="list-style-type: none"><li>Apple Pro Keyboard with full-size function and navigation keys, audio controls, and media-eject key</li><li>Apple Pro Mouse with optical sensor for precision cursor control</li></ul>
<b>Storage</b> <ul style="list-style-type: none"><li>20GB 5400-rpm Ultra ATA/66 hard disk drive<sup>3</sup></li><li>Slot-loading CD-RW drive</li><li>Support for external FireWire and USB storage devices</li></ul>	<b>Electrical requirements and agency approvals</b> <ul style="list-style-type: none"><li>Line voltage: 115V AC (90V to 132V AC) or 230V AC (180V to 264V AC)</li><li>Frequency: 47 to 63 Hz, single phase</li><li>Maximum continuous power: 205W</li><li>U.S. EPA ENERGY STAR compliant</li></ul>
<b>Graphics support</b> <ul style="list-style-type: none"><li>ATI RAGE 128 Pro graphics card with 16MB of SDRAM graphics memory installed in a dedicated AGP 2X graphics slot</li><li>Support for up to 1920-by-1200-pixel resolution at 32 bits per pixel (millions of colors)</li><li>Apple Display Connector (ADC); carries analog and digital video, USB, and power</li><li>15-pin mini D-Sub VGA connector</li></ul>	<b>Environmental requirements</b> <ul style="list-style-type: none"><li>Operating temperature: 50° to 95° F (10° to 35° C)</li><li>Storage temperature: -40° to 116° F (-40° to 47° C)</li><li>Relative humidity: 5% to 95% noncondensing</li><li>Altitude: 0 to 10,000 feet</li></ul>
<b>Communications</b> <ul style="list-style-type: none"><li>10/100BASE-T Ethernet connector (RJ-45)</li><li>Built-in 56K V.90 modem card<sup>5</sup></li><li>Optional 11-Mbps AirPort Card; IEEE 802.11 DSSS compliant<sup>4</sup></li><li>Optional AirPort Base Station containing 56K modem and 10BASE-T Ethernet port<sup>4</sup></li></ul>	<b>Size and weight</b> <ul style="list-style-type: none"><li>Height: 9.8 inches (24.8 cm)</li><li>Width: 7.7 inches (19.5 cm)</li><li>Depth: 7.7 inches (19.5 cm)</li><li>Weight: Approximately 14 pounds (6.4 kg)<sup>7</sup></li></ul>
<b>Peripheral connections</b> <ul style="list-style-type: none"><li>Two 400-Mbps FireWire (IEEE 1394) ports,6 12W total power; includes 4-pin-to-6-pin FireWire cable for connecting DV camera</li><li>Two USB ports (12 Mbps each)</li></ul>	

# 116\_Power Mac G4 (Cube) - Technical Specifications.pdf

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1. iTunes is licensed for reproduction of noncopyrighted materials or materials the user is legally permitted to reproduce.
2. 999MB maximum per application in Mac OS 9.
3. For hard drive capacity measurements, 1GB = 1 billion bytes; actual formatted capacity less.
4. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort, including America Online. Range may vary with site conditions.
5. Actual modem speeds lower; speed depends on connection rate and other factors.
6. Actual rates will vary.
7. Weight varies depending on configuration and manufacturing process.

Published Date: Apr 6, 2016

# Power Mac G4 (Gigabit Ethernet) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Power Mac G4 (Gigabit Ethernet) - Technical Specifications

Configurations			
Order no.	M7891LL/A	M7892LL/A	M7893LL/A
Processor	400-MHz PowerPC G4	Dual 450-MHz PowerPC G4	Dual 500-MHz PowerPC G4
Backside level 2 cache	1MB	1MB per processor	1MB per processor
Memory (PC100 SDRAM)	64MB	128MB	256MB
Hard disk drive <sup>3</sup>	20GB (5400 rpm)	30GB (7200 rpm)	40GB (7200 rpm)
Graphics support	16MB SDRAM	16MB SDRAM	16MB SDRAM
Optical drive	DVD-ROM (tray)	DVD-ROM (tray)	DVD-RAM (tray)
FireWire	Two 400-Mbps ports	Two 400-Mbps ports	Two 400-Mbps ports
USB	Two ports (12 Mbps each)	Two ports (12 Mbps each)	Two ports (12 Mbps each)
Ethernet	10/100/1000BASE-T	10/100/1000BASE-T	10/100/1000BASE-T
Wireless networking <sup>2</sup>	AirPort ready	AirPort ready	AirPort ready
Modem <sup>4</sup> 56K V.90 56K V.90 56K V.90			

All models also include Apple Pro Keyboard, Apple Pro Mouse, FireWire camcorder cable; Mac OS 9, QuickTime, iMovie 2, Microsoft Internet Explorer, Netscape Communicator, FAXstf, and Palm Desktop; complete setup, learning, and reference documentation; and limited warranty. Also includes 30 days of free Internet service through EarthLink.

Product contains electronic documentation. Backup software provided on CD-ROM.

Build to Order Options				
Processor	Memory	Hard Disk Drives <sup>3</sup>	Optical Drives	Other Options
400 MHz	64MB	20GB Ultra ATA/66 (5400 rpm)	DVD-ROM	ATI RAGE 128 PCI card
Dual 450 MHz	128MB	30GB Ultra ATA/66	(7200 rpm) DVD-RAM	SCSI PCI card
Dual 500 MHz	256MB	40GB Ultra ATA/66 (7200 rpm)		Zip drive
	384MB	36GB Ultra160 SCSI (10K rpm)*		AirPort Card
	512MB	72GB Ultra160 SCSI (10K rpm)*		AirPort Base Station
	768MB			
	1GB			
	1.5GB			

\* SoftRAID included with purchase of multiple Ultra160 SCSI hard disk drives.

## Technical Specifications

**Processor**

- 400-MHz, dual 450-MHz, or dual 500-MHz PowerPC G4 processor(s)
- Velocity Engine vector processing unit with 162 integrated SIMD instructions
- Full 128-bit internal memory data paths
- Powerful floating-point unit supporting single-cycle, double-precision calculations
- Data stream prefetching operations supporting four simultaneous 32-bit data streams
- 1MB backside level 2 cache per processor
- 100-MHz system bus supporting up to 800-MBps data throughput

**Memory**

- 64MB, 128MB, or 256MB of PC100 SDRAM (3.3-volt, unbuffered, 64-bit-wide, 168-pin, running at 100 MHz)
- Four DIMM slots support up to 1.5GB of PC100 SDRAM (999MB maximum per application in Mac OS 9) using the following DIMMs:
  - 64MB or 128MB DIMMs (64-bit-wide, 64-Mbit technology)
  - 128MB or 256MB DIMMs (64-bit-wide, 128-Mbit technology)
  - 512MB DIMMs (64-bit-wide, 256-Mbit technology)

**Storage<sup>3</sup>**

- One of the following hard disk drives:
  - 20GB 5400-rpm Ultra ATA/66 hard disk
  - 20GB 7200-rpm Ultra ATA/66 hard disk
  - 40GB 7200-rpm Ultra ATA/66 hard disk
- One of the following optical drives:
  - DVD-ROM drive for playing DVD movies and CDs
  - DVD-RAM drive for playing DVD movies and CDs, and writing to DVD-RAM discs (up to 9.4GB per disc)
- Three 3.5-inch hard disk drive expansion bays:
  - One ATA drive preinstalled in standard configurations
  - Support for up to two internal ATA drives
  - Support for up to three internal SCSI drives

**Graphics Support**

- ATI RAGE 128 Pro graphics card with 16MB of SDRAM graphics memory installed in a dedicated AGP 2X graphics slot
- Support for up to 1920- by 1200-pixel resolution at 32 bits per pixel (millions of colors)
- Apple Display Connector (ADC); carries analog and digital video, USB, and power
- 15-pin mini D-Sub VGA connector

**Communications**

- 10/100/1000BASE-T Ethernet connector (RJ-45)
- Built-in 56K V.90 modem card<sup>4</sup>
- Optional 11-Mbps AirPort Card; IEEE 802.11 DSSS compliant<sup>2</sup>
- Optional AirPort Base Station containing 56K modem and 10BASE-T Ethernet port<sup>2</sup>

**Peripheral connections**

- Two 400-Mbps FireWire ports; includes one 4-pin-to-6-pin FireWire cable for connecting DV camcorder
- Two USB ports (12 Mbps each)

**Expansion**

- Three full-length 64-bit, 33-MHz PCI slots
- One AGP 2X slot with graphics card installed

**Keyboard and mouse**

- Apple Pro Keyboard with full-size function and navigation keys, audio controls, and media-eject key
- Apple Pro Mouse with optical sensor for precision cursor control

**Audio**

- One input and one output analog minijack supporting 16-bit stereo audio; 44.1-kHz sampling rate
- Built-in speaker
- Support for external third-party FireWire and USB digital audio peripherals such as microphones, speakers, and MIDI devices

**Electrical requirements and agency approvals**

- Line voltage: 115V AC (90V to 132V AC) or 230V AC (180V to 264V AC)
- Frequency: 47 to 63 Hz, single phase
- Maximum continuous power: 220W
- EPA ENERGY STAR compliant

**Environmental requirements**

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Altitude: 0 to 10,000 feet (3,048 m)

**Size and weight**

- Height: 17.0 inches (43.2 cm)
- Width: 8.9 inches (22.6 cm)
- Depth: 18.4 inches (46.7 cm)
- Weight: 30.0 pounds (13.6 kg)<sup>5</sup>

1. 999MB maximum per application in Mac OS 9.  
2. Wireless Internet access requires AirPort Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort, including America Online. Range may vary with site conditions.  
3. For hard drive capacity measurements, 1GB = 1 billion bytes; actual formatted capacity less.  
4. Actual modem speeds lower; speed depends on connection rate and other factors.  
5. Weight varies depending on configuration.

# PowerBook (FireWire) - Technical Specifications

## PowerBook (FireWire) - Technical Specifications

Logic Board		Ports		Power	
Processor:	G3, 400, 500 MHz	USB:	2 yes	Max Watts:	45
PMMU:	integrated	ADB:	n/a	Amps:	1.2
FPU:	integrated	Video:	VGA Style	BTU per Hr:	153.9
Data Path:	64-bit, 100 MHz	Floppy:	none	Voltage:	100 V to 240 V AC
L1 Cache:	64K	SCSI:	none		50 Hz to 60 Hz
L2 Cache:	1MB	Geoports:	none	Freq Range:	50 Watt Hr LiIon
2nd Processor:	none	Ethernet:	10/100Base-T		Battery Type:
Slots:	One Type I or Type II PC Card	FireWire:	2	Soft Power:	yes
		Mic Type:	Built-in		
		AirPort Ready:	Yes		
		Other Ports:	Speaker, Headphone,		
Memory		Video Memory			
Logic Board:	none	ResolutionVideo Memory Built-in LCD (built-in)			
RAM Slots:	2, PC100 SO-DIMM	512 x 384	n/a		
Min - Max RAM:	64 MB - 512 MB	640 x 400	n/a		
Min RAM Speed:		640 x 480	n/a		
RAM Sizes:	Up to 256 MB	800 x 600	n/a		
Install in Groups of:	1	832 x 624	n/a		
		1024 x 768	n/a		
		1152 x 870	n/a		
		1280 x 1024	n/a		
		Notes: S-video and VGA video output ports			
Physical		Software		Storage	
Introduced:	2/15/2000	Addressing Modes:	32-bit	Floppy Size:	n/a
Discontinued:	1/9/2001	Orig SSW:	9.0	Floppy Inject:	n/a
Form Factor:	PowerBook	Orig Enabler:	n/a	Min. Int HD Size:	6, 12, 18 GB
Gestalt ID:		ROM ID:	n/a	Int HD Interface:	ATA
Weight (lbs):	6.1	ROM Ver:	n/a	Orig CD Speed	24x
Dimensions (in):	10.4 H x 12.7 W x 1.7 D	ROM Size:	4 MB	Int CD Support:	yes
Notes:	Weight is 5.7 pounds with DVD-ROM module removed and weight saving module installed.	AppleTalk Ver:	n/a		
		Mac OS Supported:	9 X		

# PowerBook G3 Series (Bronze Keyboard) - Technical Specifications

## PowerBook G3 Series (Bronze Keyboard) - Technical Specifications

Logic Board		Ports		Power	
Processor:	G3, 333 MHz	USB:	yes	Max Watts:	45
PMMU:	integrated	ADB:	none	Amps:	1.2
FPU:	integrated	Video:	HDI-15	BTU per Hr:	153.9
Data Path:	64-bit, 66/83 Mhz	Floppy:	none	Voltage:	100-240
L1 Cache:	64 K	SCSI:	HDI-30	Freq Range:	50-60 Hz
L2 Cache:	512 K	Geoports:	none	Battery Type:	50 Wh Lithium Ion
2nd Processor:	none	Ethernet:	10/100 Base-T	Soft Power:	yes
Slots:	2 Type II PC Card	FireWire:			
		Mic Type:	PlainTalk		
		AirPort Ready:	3rd Party		
		Other Ports:	Printer, Modem, Speaker, Headphone,		
Memory		Video Memory			
Logic Board:	none	Video Memory			
RAM Slots:	2, SO-DIMM	Resolution	built-in LCD (8 MB VRAM) (built-in)		
Min - Max RAM:	64 MB - 384 MB	512 x 384	n/a		
Min RAM Speed:	10 ns	640 x 400	n/a		
RAM Sizes:	64, 128, 256 MB	640 x 480	n/a		
Install in Groups of:	1	800 x 600	n/a		
		832 x 624	n/a		
		1024 x 768	32-bit		
		1152 x 870	n/a		
		1280 x 1024	n/a		
Physical		Software		Storage	
Introduced:	5/1/1999	Addressing Modes:	32-bit	Floppy Size:	none
Discontinued:	n/a	Orig SSW:	8.6	Floppy Inject:	n/a
Form Factor:	PowerBook G3 Series	Orig Enabler:		Min. Int HD Size:	4, 6, 10 GB
Gestalt ID:		ROM ID:		Int HD Interface:	IDE
Weight (lbs):	5.9	ROM Ver:		Orig CD Speed	24x
Dimensions (in):	12.7 H x 10.4 W x 1.7 D	ROM Size:		Int CD Support:	yes
		AppleTalk Ver:		Notes:	Optional 2x-speed (maximum) DVD-ROM drive for use in expansion bay; supports CD-ROM discs at up to 20x speed*
		Mac OS Supported:	8.6 9 X		

Logic Board	Ports	Power



119\_PowerBook G3 Series (Bronze Keyboard) - Technical Specifications.pdf

Processor: G3, 400 MHz		USB: 1 yes		Max Watts: 45	
PMMU: integrated		ADB: none		Amps: 1.2	
FPU: integrated		Video: HDI-15		BTU per Hr: 153.9	
Data Path: 64-bit, 66/83Mhz		Floppy: none		Voltage: 100-240	
L1 Cache: 64kb		SCSI: HDI-30		Freq Range: 50-60 Hz	
L2 Cache: 1 MB		Geoports: none		Battery Type: 50 Wh Lithium Ion	
2nd Processor: none		Ethernet: 10/100 Base-T		Soft Power: yes	
Slots: (1) Type II PC Card		FireWire:			
		Mic Type: PlainTalk			
		AirPort Ready: 3rd Party			
		Other Ports: Printer, Modem, Speaker, Headphone,			
Memory		Video Memory			
Logic Board: none		Video Memory			
RAM Slots: 2, SO-DIMM		Resolution built-in LCD (8MB VRAM) (built-in)			
Min - Max RAM: 64 MB - 384 MB		512 x 384 n/a			
Min RAM Speed: 10ns		640 x 400 n/a			
RAM Sizes: 64, 128, 256 MB		640 x 480 n/a			
Install in Groups of: 1		800 x 600 n/a			
		832 x 624 n/a			
		1024 x 768 32-bit			
		1152 x 870 n/a			
		1280 x 1024 n/a			
		Notes: supports millions of colors at 1,024- by 768-pixel resolution; supports resolution scaling to 640- by 480-pixel or 800- by 600-pixel resolution			
Physical		Software		Storage	
Introduced: 5/7/1999		Addressing Modes: 32-bit		Floppy Size: none	
Discontinued: n/a		Orig SSW: 8.6		Floppy Inject: n/a	
Form Factor: PowerBook G3 Series		Orig Enabler:		Min. Int HD Size: 6, 10 GB	
Gestalt ID:		ROM ID:		Int HD Interface: IDE	
Weight (lbs): 5.9		ROM Ver:		Orig CD Speed 24x	
Dimensions (in): 12.7 H x 10.4 W x 1.7 D		ROM Size:		Int CD Support: yes	
		AppleTalk Ver:			
		Mac OS Supported: 8.6 9 X			

Published Date: Jul 26, 2017

# Mac Pro (Early 2008) - Technical Specifications

	Standard Configuration (MA970LL/A)	Build-to-Order Options
<b>Processor</b>	Two 2.8GHz Quad-Core Intel Xeon processors	Two 3.0GHz or 3.2GHz Quad-Core Intel Xeon processors One 2.8GHz Quad-Core Intel Xeon processor
<b>Memory</b>	2GB (two 1GB) of 800MHz DDR2 ECC fully buffered DIMM	4GB (four 1GB) 8GB (four 2GB) 16GB (four 4GB) 16GB (eight 2GB) 32GB (eight 4GB)
<b>PCI Express graphics</b>	ATI Radeon HD 2600 XT 256MB (two dual-link DVI ports)	NVIDIA GeForce 8800 GT 512MB (two dual-link DVI ports) NVIDIA Quadro FX 5600 1.5GB (stereo 3D, two dual-link DVI ports) Two ATI Radeon HD 2600 XT 256MB Three ATI Radeon HD 2600 XT 256MB Four ATI Radeon HD 2600 XT 256MB
<b>Hard disk drive</b>	320GB Serial ATA 3Gb/s; 7200 rpm; 8MB cache	Hard Drive Bay 1 500GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache 750GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache 1TB Serial ATA 3Gb/s; 7200 rpm; 32MB cache 300GB Serial Attached SCSI 3Gb/s; 15,000 rpm; 16MB cache  Hard Drive Bay 2 500GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache 750GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache 1TB Serial ATA 3Gb/s; 7200 rpm; 32MB cache 300GB Serial Attached SCSI 3Gb/s; 15,000 rpm; 16MB cache  Hard Drive Bay 3 500GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache 750GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache 1TB Serial ATA 3Gb/s; 7200 rpm; 32MB cache 300GB Serial Attached SCSI 3Gb/s; 15,000 rpm; 16MB cache  Hard Drive Bay 4 500GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache 750GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache 1TB Serial ATA 3Gb/s; 7200 rpm; 32MB cache 300GB Serial Attached SCSI 3Gb/s; 15,000 rpm; 16MB cache
<b>Internal RAID</b>	Optional	Mac Pro RAID Card with 256MB cache and 72-hour cache battery backup <sup>5</sup>
<b>Optical drive</b>	16x SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)	Two 16x SuperDrive optical drives with double-layer support (DVD±R DL/DVD±RW/CD-RW)
<b>Wireless</b>	Bluetooth 2.0 + EDR	AirPort Extreme wireless networking <sup>2</sup>
<b>PCI Express</b>	Optional	Apple Dual-Channel or Quad-Channel 4Gb Fibre Channel PCI Express Card
<b>Displays</b>	Optional	20-inch Apple Cinema Display (M9177LL/A) 23-inch Apple Cinema HD Display (M9178LL/A) 30-inch Apple Cinema HD Display (M9179LL/A)

## Processing

- 8-core: Two 2.8GHz, 3.0GHz, or 3.2GHz Quad-Core Intel Xeon 5400 series processors
- Quad-core: One 2.8GHz Quad-Core Intel Xeon 5400 series processor
- Enhanced Intel Core microarchitecture
  - 12MB of L2 cache per processor (each pair of cores shares 6MB)
  - 128-bit SSE4 SIMD engine
  - 64-bit data paths and registers
  - Energy efficiency optimization
- 1600MHz, 64-bit dual independent frontside buses

## Memory

- 800MHz DDR2 ECC fully buffered DIMM (FB-DIMM) memory
- Eight FB-DIMM slots on two memory riser cards (four slots per card) supporting up to 32GB of main memory
- 256-bit-wide memory architecture

## Graphics and displays

- Double-wide, 16-lane PCI Express 2.0 graphics slot with one of the following graphics cards installed:
  - ATI Radeon HD 2600 XT with 256MB of GDDR3 memory and two dual-link DVI ports
  - NVIDIA GeForce 8800 GT with 512MB of GDDR3 memory and two dual-link DVI ports
  - NVIDIA Quadro FX 5600 with 1.5GB of GDDR3 memory, two dual-link DVI ports, and one stereo 3D port
- Multiple graphics card configurations including two, three, or four ATI Radeon HD 2600 XT cards
- 300W for up to four PCI Express graphics cards

# 11\_Mac Pro (Early 2008) - Technical Specifications.pdf

- Support for up to eight 30-inch displays<sup>1</sup>
- Support for digital resolutions up to 2560 by 1600 pixels
- Support for analog resolutions up to 2048 by 1536 pixels
- DVI to VGA adapter included
- Dual-display support for extended desktop and video mirroring modes

## Communications

- Two independent 10/100/1000BASE-T Ethernet (RJ-45) interfaces with support for jumbo frames
- Bluetooth 2.0 + Enhanced Data Rate (EDR) up to 3Mb/s
- Optional 802.11n AirPort Extreme wireless networking<sup>2</sup>
- Optional external Apple USB Modem (RJ-11)

## Storage

- Four 3.5-inch cable-free, direct-attach hard drive bays with built-in independent 3Gb/s Serial ATA channels; four internal hard drive carriers included
- Up to 4TB of internal storage<sup>3</sup> using hard drives in the following capacities:
  - Hard drive bay 1
    - 320GB Serial ATA 3Gb/s, 7200 rpm, 8MB cache
    - 500GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
    - 750GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
    - 1TB Serial ATA 3Gb/s, 7200 rpm, 32MB cache
    - 300GB Serial Attached SCSI 3Gb/s, 15,000 rpm, 16MB cache<sup>4</sup>
  - Hard drive bay 2
    - 500GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
    - 750GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
    - 1TB Serial ATA 3Gb/s, 7200 rpm, 32MB cache
    - 300GB Serial Attached SCSI 3Gb/s, 15,000 rpm, 16MB cache<sup>4</sup>
  - Hard drive bay 3
    - 500GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
    - 750GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
    - 1TB Serial ATA 3Gb/s, 7200 rpm, 32MB cache
    - 300GB Serial Attached SCSI 3Gb/s, 15,000 rpm, 16MB cache<sup>4</sup>
  - Hard drive bay 4
    - 500GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
    - 750GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
    - 1TB Serial ATA 3Gb/s, 7200 rpm, 32MB cache
    - 300GB Serial Attached SCSI 3Gb/s, 15,000 rpm, 16MB cache<sup>4</sup>
- Optional Mac Pro RAID card with 256MB cache and 72-hour cache battery backup<sup>5</sup>
- 16x SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)
  - Writes DVD+R and DVD-R discs at up to 16x speed
  - Writes DVD+R DL and DVD-R DL discs at up to 8x speed
  - Writes DVD+RW discs at up to 8x speed
  - Writes DVD-RW discs at up to 6x speed
  - Reads DVDs at up to 16x speed
  - Writes CD-R and CD-RW discs at up to 32x speed
  - Reads CDs at up to 32x speed
- One open optical drive bay for optional second SuperDrive

## Electrical and environmental requirements

- ENERGY STAR configurations available<sup>6</sup>
- Line voltage: 100-120V AC or 200-240V AC (wide-range power supply input voltage)
- Frequency: 50Hz to 60Hz single phase
- Current: Maximum of 12A (low-voltage range) or 6A (high-voltage range)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Peripherals and audio

- Two FireWire 800 ports (one on front panel, one on back panel)
- Two FireWire 400 ports (one on front panel, one on back panel)
- Five USB 2.0 ports (two on front panel, three on back panel)
- Two USB 2.0 ports on included keyboard
- Front-panel headphone minijack and speaker
- Optical digital audio input and output TOSLINK ports
- Analog stereo line-level input and output minijacks

## PCI Express expansion<sup>7</sup>

# 11\_Mac Pro (Early 2008) - Technical Specifications.pdf

- Three open full-length PCI Express expansion slots
  - One PCI Express 2.0 x16 slot
  - Two PCI Express x4 slots
- All slots provide mechanical support for 16-lane cards
- 300W combined maximum for all PCI Express slots

## Software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, and GarageBand)

## Size and weight

- Height: 20.1 inches (51.1 cm)
- Width: 8.1 inches (20.6 cm)
- Depth: 18.7 inches (47.5 cm)
- Weight (standard configuration): 42.4 pounds (19.2 kg)<sup>8</sup>

## In the box

- Mac Pro
- Apple Keyboard and Mighty Mouse
- DVI to VGA adapter
- USB keyboard extension cable
- Install/restore DVDs
- Printed and electronic documentation

## Upgrades

- 2GB Memory kit (MB192G/A)
- 4GB Memory kit (MB193G/A)
- 8GB Memory kit (MB194G/A)
- 500GB SATA drive kit (MA988G/A)
- 750GB SATA drive kit (MA989G/A)
- 1TB SATA drive kit (MB362G/A)
- 300GB SAS drive kit (MB195G/A)
- Mac Pro RAID Card (MA849Z/B)
- NVIDIA GeForce 8800 GT Graphics Upgrade Kit (MB137Z/A)
- ATI Radeon HD 2600 XT Graphics Upgrade Kit (MB198Z/A)
- Apple Dual-Channel 4Gb Fibre Channel PCI Express Card (MB355G/A)
- Apple Quad-Channel 4Gb Fibre Channel PCI Express Card (MB356G/A)

## Accessories

- AirPort Extreme Base Station (MA073LL/A)
- AirPort Express Base Station featuring AirTunes (M9470LL/A)
- Apple Wireless Keyboard (M9270LL/A)
- Apple wireless Mighty Mouse (MB111LL/A)
- Apple USB Modem (MA034Z/A)
- .Mac Subscription (MA361Z/A)
- AppleCare Protection Plan (MA516LL/A)

## Applications

- Final Cut Studio (MA285Z/A)
- Final Cut Express (MA261Z/A)
- Aperture (MA438Z/A)
- Logic Pro (MA328Z/A)
- Logic Express (MA603Z/A)
- Shake (MA434Z/A)
- Mac OS X Server v10.4 (10-client license) (MA613Z/A)
- Mac OS X Server v10.4 (Unlimited-client license) (MA612Z/A)
- Apple Remote Desktop (MA231Z/A)
- iWork '08 (MA790Z/A)

1. Requires installation of four ATI Radeon HD 2600 XT graphics cards, each of which provides support for up to two 20-inch Apple Cinema Displays, 23-inch Apple Cinema HD Displays, or 30-inch Apple Cinema HD Displays.
2. Wireless Internet access requires base station or other wireless access point and Internet access (fees may apply). Achieving optimal 802.11n data rates requires that all users have an 802.11n AirPort Extreme Card and connect to an 802.11n AirPort Extreme Base Station. Speed and range will be less if an 802.11a/b/g product joins the network. Actual performance will vary based on range, connection rate, site conditions, size of network, and other factors. Range will vary with site conditions. Based on IEEE 802.11n draft specification.
3. 1TB = approximately 1 trillion bytes; actual formatted capacity less.
4. Serial Attached SCSI drives require the Mac Pro RAID Card.
5. Supports Mac OS X only.
6. 8-core 2.8GHz Mac Pro systems configured with one ATI Radeon HD 2600 XT graphics card meet ENERGY STAR requirements. 8-core 3.0GHz and 3.2GHz Mac Pro systems configured with a single graphics card meet ENERGY STAR requirements. All other Mac Pro systems meet ENERGY STAR 3.0 requirements. Systems configured with an Apple Fibre Channel or Mac Pro RAID Card do not comply with ENERGY STAR requirements.
7. PCI Express slots are not compatible with PCI or PCI-X expansion cards.
8. Actual weight varies by configuration and manufacturing process.

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# Apple Studio Display LCD DVI (15") - Technical Specifications

## Apple Studio Display LCD DVI (15") - Technical Specifications

Configurations	Apple Studio Display LCD DVI
Model	M7612
Screen Size (diagonal veivable image size)	15.1 inches (38.4 cm) viewable diagonal
Screen type	LCD, Thin film transistor (TFT) active-matrix liquid crystal display (AMLCD)
Resolutions	<ul style="list-style-type: none"><li>■ 1024 x 768 (native resolution)</li><li>■ 800 x 600</li><li>■ 640 x 480</li></ul>
Display colors (maximum)	16.7 million
Brightness (typical)	200 (candelas per meter squared)
Contrast ratio (typical)	200:1
User controls (hardward and software)	Power, Brightness
Display connector	DVI
Serial (USB or ADB) connectors:	2 USB 1.1 ports (on back of display, under USB cover)
System requirements	Power Mac G4 computer with ATI RAGE 128 Pro graphics card and built-in USB
Power	<ul style="list-style-type: none"><li>■ Maximum: ???</li><li>■ Energy Saver Mode: 35W</li></ul>

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# iMac (Slot Loading) - Technical Specifications

## iMac (Slot Loading) - Technical Specifications

Logic Board		Ports		Power	
Processor:	G3, 350 or 400 MHz	USB:	2 yes	Max Watts:	150
PMMU:	integrated	ADB:	n/a	Amps:	1.7
FPU:	integrated	Video:	DB-15 VGA (DV, Special Edition)	BTU per Hr:	513
Data Path:	, 100 MHz	Floppy:	none	Voltage:	100-260
L1 Cache:		SCSI:	none	Freq Range:	47-63 Hz
L2 Cache:	512K	Geoports:	none	Battery Type:	3.6V Lithium
2nd Processor:	none	Ethernet:	10/100 Base-T	Soft Power:	yes
Slots:	0	FireWire:	2 (DV, Special Edition)		
		Mic Type:	PlainTalk		
		AirPort Ready:	Yes		
		Other Ports:	Modem, Speaker, Headphone,		
Memory		Video Memory			
Logic Board:	none	<div>Video Memory</div> <div>Resolution8MB (SGRAM)</div>			
RAM Slots:	2, PC100 DIMM	512 x 384	n/a		
Min - Max RAM:	64 MB - 512 MB	640 x 400	n/a		
Min RAM Speed:		640 x 480	32-bit		
RAM Sizes:	64, 128, 256, 512 MB	800 x 600	32-bit		
Install in Groups of:	1	832 x 624	n/a		
		1024 x 768	32-bit		
		1152 x 870	n/a		
		1280 x 1024	n/a		
		Notes: VGA port for video mirroring on all DV models			
Physical		Software		Storage	
Introduced:	10/4/1999	Addressing Modes:	32-bit	Floppy Size:	n/a
Discontinued:	7/19/2000	Orig SSW:	8.6	Floppy Inject:	n/a
Form Factor:	iMac	Orig Enabler:		Min. Int HD Size:	6, 10, 13 GB
Gestalt ID:		ROM ID:		Int HD Interface:	ATA
Weight (lbs):	34.7	ROM Ver:		Orig CD Speed	24x
Dimensions (in):	15.8 H x 15.2 W x 17.6 D	ROM Size:	1 MB*	Int CD Support:	yes
Notes:	Comes in five different colors: Strawberry, Blueberry, Grape, Lime and Tangerine.	AppleTalk Ver:	60		
		Mac OS Supported:	8.6 9 X		

# Power Mac G4 (PCI Graphics) - Technical Specifications

## Power Mac G4 (PCI Graphics) - Technical Specifications

Logic Board		Ports		Power	
Processor:	G4, 350, 400MHz	USB:	2 yes	Max Watts:	200
PMMU:	integrated	ADB:	n/a	Amps:	
FPU:	integrated	Video:	15 pin VGA	BTU per Hr:	684
Data Path:	128-bit, 100 MHz	Floppy:	none	Voltage:	115-230
L1 Cache:	64K	SCSI:	PCI card	Freq Range:	47-63 Hz
L2 Cache:	512/1M	Geoports:	none	Battery Type:	3.6V Lithium
2nd Processor:	none	Ethernet:	10/100Base-T	Soft Power:	yes
Slots:	4 PCI, one dedicated to video	FireWire:	3	Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Speaker, Headphone,		

Memory	
Logic Board:	none
RAM Slots:	4, PC100 DIMM
Min - Max RAM:	64 MB - 1 GB
Min RAM Speed:	
RAM Sizes:	32, 64, 128, 256 MB
Install in Groups of:	1
Notes:	Requires 128Mbit memory. <b>See Related Documents for detailed information on RAM.</b>

Video Memory	Resolution
512 x 384	n/a
640 x 400	n/a
640 x 480	n/a
800 x 600	n/a
832 x 624	n/a
1024 x 768	n/a
1152 x 870	n/a
1280 x 1024	n/a

Physical		Software		Storage	
Introduced:	9/15/1999	Addressing Modes:	32-bit	Floppy Size:	n/a
Discontinued:	12/31/1999	Orig SSW:	8.6	Floppy Inject:	n/a
Form Factor:	Tower	Orig Enabler:	n/a	Min. Int HD Size:	10GB
Gestalt ID:	n/a	ROM ID:	n/a	Int HD Interface:	ATA or SCSI
Weight (lbs):	30	ROM Ver:	1.2	Orig CD Speed	24x
Dimensions (in):	17 H x 8.9 W x 18.4 D	ROM Size:	1 MB	Int CD Support:	yes
		AppleTalk Ver:	n/a	Notes:	Internal HD interface = ultraATA-33 & wide Ultra 2 SCSI. Optional DVD-ROM: optional Zip.



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	Mac OS Supporter:	8.6, 9, X	
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# Power Mac G4 (AGP Graphics) - Technical Specifications

## Power Mac G4 (AGP Graphics) - Technical Specifications

Logic Board		Ports		Power	
Processor:	G4, 350, 400, 450, 500	USB:	2	Max Watts:	200
PMMU:	integrated	ADB:	n/a	Amps:	
FPU:	integrated	Video:	15 pin VGA, or DVI	BTU per Hr:	684
Data Path:	128-bit, 100 MHz	Floppy:	none	Voltage:	115 - 230
L1 Cache:	64K	SCSI:	PCI card	Freq Range:	47 - 63 Hz
L2 Cache:	1 MB	Geoports:	none	Battery Type:	3.6V Lithium
2nd Processor:	none	Ethernet:	10/100Base-T	Soft Power:	yes
Slots:	(3) PCI , (1) 2x AGP dedicated to video	FireWire:	3	Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:	Yes		
		Other Ports:	Speaker, Headphone		

Memory	
Logic Board:	none
RAM Slots:	4, PC100 DIMM
Min - Max RAM:	64 MB - 1.5 GB
Min RAM Speed:	
RAM Sizes:	32, 64, 128, 256, 512MB
Install in Groups of:	

Video Memory	
Resolution	Video Memory
512 x 384	n/a
640 x 400	n/a
640 x 480	n/a
800 x 600	n/a
832 x 624	n/a
1024 x 768	n/a
1152 x 870	n/a
1280 x 1024	n/a

Physical		Software		Storage	
Introduced:	9/15/1999	Addressing Modes:	32-bit	Floppy Size:	none
Discontinued:	n/a	Orig SSW:	8.6	Floppy Inject:	
Form Factor:	PM G3/G4	Orig Enabler:	n/a	Min. Int HD Size:	10GB minimum
Gestalt ID:	n/a	ROM ID:	n/a	Int HD Interface:	ATA-66 or SCSI
Weight (lbs):	30	ROM Ver:		Orig CD Speed	32x
Dimensions (in):	17 H x 8.9 W x 18.4 D	ROM Size:		Int CD Support:	yes
		AppleTalk Ver:			
		Mac OS Supported:	9, 8.6		

# 123\_Power Mac G4 (AGP Graphics) - Technical Specifications.pdf

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# Apple Cinema Display - Technical Specifications

## Apple Cinema Display - Technical Specifications

Configurations	Apple Cinema Display
Model	M7478
Screen Size (diagonal veiwable image size)	22 inches (diagonal viewable)
Screen type	LCD, Screen type: Thin film transistor (TFT) active-matrix liquid crystal display (AMLCD)
Resolutions	<ul style="list-style-type: none"><li>1600 x 1024 (native resolution)</li><li>1280 x 800</li><li>1024 x 640</li><li>800 x 500</li></ul>
Display colors (maximum)	16.7 million
Brightness (typical)	180 (candelas per meter squared)
Contrast ratio (typical)	300:1
User controls (hardward and software)	Power, Brightness
Display connector	DVI
Serial (USB or ADB) connectors:	2 USB 1.1 ports (on back of display)
System requirements	Power Mac G4 computer with AGP 2X expansion slot, Digital Visual Interface (DVI) video card, and built-in USB
Power	<ul style="list-style-type: none"><li>Maximum: 77W</li><li>Energy Saver Mode: 35W</li></ul>

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# AirPort Base Station (Graphite) - Technical Specifications

The AirPort Base Station is recommended for up to 10 users. It includes a base unit, external power supply, telephone cord, wall mount bracket, and complete software.

## Wireless data rate

- Up to 11 Mbps

## Range

- 150 ft (50 m) in typical use (varies with building construction)

## Frequency band

- 2.4 GHz

## Radio output power

- 15 dBm (nominal)

## Compatibility

- IEEE 802.11HR Direct Sequence Spread Spectrum (DSSS) 11 Mbps and 5.5 Mbps draft standard
- IEEE 802.11 DSSS 1 and 2 Mbps standard
- IEEE C95.1-1991
- Wi-Fi (IEEE 802.11b High Rate) standard and the Wi-Fi (Wireless Fidelity) interoperability

## Included software

- AirPort Setup Assistant to configure the computer for network access and set up an AirPort Base Station or Software Base Station
- AirPort application to change networks and check signal strength
- AirPort Control Strip module to quickly measure signal strength and change networks
- AirPort Utility for base station network administration

## AirPort Card

Family Number: M7600

## Environmental requirements

- Operating temperature: 32 to 95 F (0 C to 35 C)
- Storage temperature: -13 to 140 F (-25 C to 60 C)
- Relative humidity (operating): 95 percent maximum
- Relative humidity (storage): 95 percent maximum, noncondensing
- Operating altitude: 0 to 10,000 feet (0 to 3048 m)
- Maximum storage altitude: 15,000 feet (4572 m)

## AirPort Base Station (Graphite)

Family Number: M7601

## Interfaces

- RJ-11 connector for built-in 56 kbps V.90 modem
- RJ-45 connector for built-in 10BASE-T Ethernet
- Wireless
- AC power

## Mounting options

- Desktop
- Wall mount (bracket included)

## Electrical requirements

*North America and Japan*

- Line voltage: 100 V to 120 V AC
- Frequency: 50 Hz to 60 Hz

*Europe, Australia*

- Line voltage: 200 V to 240 V AC
- Frequency: 50 Hz to 60 Hz

## Environmental requirements

- Operating temperature: 32 to 95 F (0 C to 35 C)
- Storage temperature: -13 to 140 F (-25 C to 60 C)
- Relative humidity (operating): 20 to 80 percent
- Relative humidity (storage): 10 to 90 percent, noncondensing
- Operating altitude: 0 to 10,000 feet (0 to 3048 m)
- Maximum storage altitude: 15,000 feet (4572 m)

## Size and mass

- Diameter: 6.9 inches (175 mm)
- Height: 3.2 inches (80 mm)
- Mass (weight, without wall mount bracket): 1.65 pounds (750 grams)

## System Requirements

- An AirPort-capable Macintosh computer
- At least 32 MB of memory (RAM)
- Mac OS 8.6 or later
- Mac OS 9.0.4 or later is required to use AirPort 1.3 or later

**Note:** Wireless Internet access requires an AirPort Card, AirPort Base Station, and an Internet service provider, for which fees may apply. Some ISPs are not compatible with AirPort. America Online (AOL) works with AirPort software version 2.0 or later. For more information about AOL compatibility, see [AirPort: How to Use with AOL](#). Range may vary with site conditions.

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iBook - Technical Specifications

iBook - Technical Specifications

Logic Board	Ports	Power
Processor: G3, 300 or 366 MHz	USB: 1	Max Watts: 45
PMMU: integrated	ADB: none	Amps:
FPU: integrated	Video: none	BTU per Hr: 153.9
Data Path: 64-bit, 66 Mhz	Floppy: none	Voltage: 100-240
L1 Cache: 64 K	SCSI: none	Freq Range: 50-60 Hz
L2 Cache: 512 K	Geoports: none	Battery Type: 45 Wh Lithium Ion
2nd Processor: none	Ethernet: 10/100 Base-T	
Slots:	FireWire: none	
	Mic Type: none	
	AirPort Ready: Yes	
	Other Ports: Speaker, Headphone,	
Memory	Video Memory	
Logic Board: 32 or 64 MB	Video Memory	
RAM Slots: 1, SO-DIMM	Resolution (N/A)	
Min - Max RAM: 32 or 64 MB - 288 or 320 MB	512 x 384 n/a-bit	
Min RAM Speed:	640 x 400 n/a-bit	
RAM Sizes: 32, 64, 128, 2 56 MB	640 x 480 32-bit	
Install in Groups of: 1	800 x 600 32-bit	
	832 x 624 n/a-bit	
	1024 x 768 n/a-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
	Notes: supports 640- by 480-pixel and 800- by 600-pixel resolution with millions of colors	
Physical	Software	Storage
Introduced: 7/21/1999	Addressing Modes: 32-bit	Floppy Size: none
Discontinued: n/a	Orig SSW: 8.6	Floppy Inject: n/a
Form Factor: iBook	Orig Enabler:	Min. Int HD Size: 3.2 or 6 GB
Gestalt ID:	ROM ID:	Int HD Interface: IDE
Weight (lbs): 6.7	ROM Ver:	Orig CD Speed: 24x
Dimensions (in): 11.6 H x 13.5 W x 1.8 D	ROM Size:	Int CD Support: yes
	AppleTalk Ver:	
	Mac OS Supported: 9 8.6 X	
	Notes: 128 MB of memory is recommended for Mac OS X	

# PowerBook G3 - Technical Specifications

## PowerBook G3 - Technical Specifications

Logic Board	Ports	Power
Processor: G3, 250MHz	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.88
FPU: integrated	Video: HDI-15	BTU per Hr: 153.9
Data Path: 64-bit, 50Mhz	Floppy: none	Voltage: 100-240
L1 Cache: n/a	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: 512K	Geoports: 1	Battery Type: 47 Wh Lithium Ion
2nd Processor: none	Ethernet: 10BaseT	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: Line In	
	AirPort Ready:	
	Other Ports: Printer, Speaker, Headphone,	
Memory	Video Memory	
Logic Board: 32 MB	Video Memory	
RAM Slots: 1, PB G3	Resolution built-in LCD (2MB VRAM) (built-in)	
Min - Max RAM: 32 MB - 160 MB	512 x 384	n/a-bit
Min RAM Speed: 60ns	640 x 400	n/a-bit
RAM Sizes: 4-128 MB	640 x 480	n/a-bit
Install in Groups of: 1	800 x 600	16-bit
Notes: Support EDO RAM devices on its memory modules	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: 2MB of VRAM supports millions of colors on external monitor; Chips and Technology 65554 PCI video controller support hardware acceleration	
Physical	Software	Storage
Introduced: 11/15/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 8.0	Floppy Inject: manual
Form Factor: PowerBook 3400	Orig Enabler:	Min. Int HD Size: 5GB
Gestalt ID: 313	ROM ID:	Int HD Interface: ATA
Weight (lbs): 7.5	ROM Ver: \$077D	Orig CD Speed 20x
Dimensions (in): 2.4 H x 11.5 W x 9.5 D	ROM Size: 3072K	Int CD Support: yes
	AppleTalk Ver: 60.2	
	Mac OS Supported: 8.0	
	8.1	
	8.5	
	8.6	
	9	

# PowerBook G3 Series - Technical Specifications

## PowerBook G3 Series - Technical Specifications

Logic Board	Ports	Power
Processor: G3, 233	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.2
FPU: integrated	Video: HDI-15	BTU per Hr: 153.9
Data Path: 64-bit, 66/83 MHz	Floppy: none	Voltage: 100-240
L1 Cache: 64K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: 512K	Geoports: 1	Battery Type: 49 Wh Lithium Ion
2nd Processor: none	Ethernet: 10Base-T	Soft Power: yes
Slots: 2 Type II PC Card (1Type III) Cardbus	FireWire:	
Notes: Slots : 2 Type II PC Card s or 1 Type III PC Card or CardBus cards	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer, Modem, Speaker, Headphone,	
Memory	Video Memory	
Logic Board: none	Video Memory	
RAM Slots: 2, 144pin SDRAM	Resolution built-in LCD (2MB VRAM) (built-in)	
Min - Max RAM: 32 MB - 192 MB	512 x 384 n/a-bit	
Min RAM Speed: 100 MHz	640 x 400 16-bit	
RAM Sizes: 32MB, 64MB, 128 MB	640 x 480 n/a-bit	
Install in Groups of: 1	800 x 600 16-bit	
Notes: 144 -pin SDRAM 2 SO-DIMM slots supports up to 192MB 128 MB DIMM installs in top slot only	832 x 624 n/a-bit	
	1024 x 768 n/a-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
Physical	Software	Storage
Introduced: 10/1/1998	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 8.1	Floppy Inject: manual
Form Factor: PowerBook G3 Series	Orig Enabler: PowerBook G3 Series 1.1	Min. Int HD Size: 2 GB
Gestalt ID: 314	ROM ID: n/a	Int HD Interface: IDE
Weight (lbs): 7.2	ROM Ver: n/a	Orig CD Speed: 20x
Dimensions (in): 2 H x 12.7 W x 10.4 D	ROM Size: 4 MB	Int CD Support: yes
Notes: Family Model #M4753 Weight includes modem, battery and CD-ROM module	AppleTalk Ver: n/a	Notes: DVD -ROM drive available CD-ROM and Floppy are removable modules
	Mac OS Supported: 8.1 8.5 8.6 9 X (10.2.8 or earlier)	

Logic Board	Ports	Power



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Processor: G3, 233/250	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.2
FPU: integrated	Video: HDI-15	BTU per Hr: 153.9
Data Path: 64-bit, 66/83Mhz	Floppy: none	Voltage: 100-240
L1 Cache: 64K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: (none (233))/1MB (250/292)	Geoports: 1	Battery Type: 49 Wh Lithium Ion
2nd Processor: none	Ethernet: 10Base-T	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
Notes: Backside bus speed 125MHz Slots: PC Cards slots for two Type II PC Cards or one Type II card or CardBus cards	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer, Modem, Speaker, Headphone,	
Memory		Video Memory
Logic Board: none	Video Memory	
RAM Slots: 2, 144pin SDRAM	Resolution built-in LCD (4MB VRAM) (built in)	
Min - Max RAM: 32 MB - 192 MB	512 x 384 n/a-bit	
Min RAM Speed: 100 MHz	640 x 400 n/a-bit	
RAM Sizes: 32MB, 64MB, 128 MB	640 x 480 n/a-bit	
Install in Groups of: 1	800 x 600 n/a-bit	
Notes: 2 S0-DIMM slots supports up to 192MB 144-pin SDRAM 128 MB DIMM installs in top slot only	832 x 624 n/a-bit	
	1024 x 768 24-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
	Notes: S-video output	
Physical	Software	Storage
Introduced: 9/1/1998	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 8.1	Floppy Inject: manual
Form Factor: PowerBook G3 Series	Orig Enabler: PowerBook G3 Series 1.0	Min. Int HD Size: 2, 4 GB
Gestalt ID: 312	ROM ID: n/a	Int HD Interface: IDE
Weight (lbs): 7.6	ROM Ver: n/a	Orig CD Speed: 20x
Dimensions (in): 2 H x 12.7 W x 10.4 D	ROM Size: 4 MB	Int CD Support: yes
Notes: Family Model # M4753 Weight includes modem, battery and CD-ROM module	AppleTalk Ver: n/a	Notes: DVD-ROM Drive available CD-ROM and Floppy are removable modules
	Mac OS Supported: 8.1 8.5 8.6 9 X (10.2.8 or earlier)	

Logic Board	Ports	Power

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Processor: G3, 233/250/292	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.2
FPU: integrated	Video: HDI-15	BTU per Hr: 153.9
Data Path: 64-bit, 66/83Mhz	Floppy: none	Voltage: 100-240
L1 Cache: 64K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none (233)/1MB (250, 292)	Geoports: 1	Battery Type: 49 Wh Lithium Ion
2nd Processor: none	Ethernet: 10Base-T	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
Notes: Slots: PC Cards slots for two Type II PC Cards or one Type II card or CardBus cards Backside bus speed 146MHz	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer, Modem, Speaker, Headphone,	
Memory	Video Memory	
Logic Board: none	Resolution built-in LCD (4MB VRAM) (built-in)	
RAM Slots: 2, 144pin SDRAM	512 x 384 n/a-bit	
Min - Max RAM: 32 MB - 192 MB	640 x 400 n/a-bit	
Min RAM Speed: 100 MHz	640 x 480 n/a-bit	
RAM Sizes: 32MB, 64MB, 128 MB	800 x 600 n/a-bit	
Install in Groups of: 1	832 x 624 n/a-bit	
Notes: Two SO-DIMM slots support to 192MB 144-pin SDRAM 128 MB DIMM installs in top slot only	1024 x 768 24-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
	Notes: S-video output	
Physical	Software	Storage
Introduced: 9/1/1998	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 8.1	Floppy Inject: manual
Form Factor: PowerBook G3 Series	Orig Enabler: PowerBook G3 Series 1.0	Min. Int HD Size: 2, 4, 8 GB
Gestalt ID: 312	ROM ID: n/a	Int HD Interface: IDE
Weight (lbs): 7.8	ROM Ver: n/a	Orig CD Speed: 20x
Dimensions (in): 2 H x 12.7 W x 10.4 D	ROM Size: 4 MB	Int CD Support: yes
Notes: Family Model # M4753 Weight includes modem, battery and CD-ROM module	AppleTalk Ver: n/a	Notes: DVD-ROM Drive available CD-ROM and Floppy are removable modules
	Mac OS Supported: 8.1 8.5 8.6 9 X (10.2.8 or earlier)	

Logic Board	Ports	Power

# 128\_PowerBook G3 Series - Technical Specifications.pdf

<b>Processor:</b> G3, 233/266/300		<b>USB:</b>		<b>Max Watts:</b> 45																					
<b>PMMU:</b> integrated		<b>ADB:</b> 1		<b>Amps:</b> 1.2																					
<b>FPU:</b> integrated		<b>Video:</b> HDI-15		<b>BTU per Hr:</b> 153.9																					
<b>Data Path:</b> 64-bit, 66Mhz		<b>Floppy:</b> none		<b>Voltage:</b> 100-240																					
<b>L1 Cache:</b> 64K		<b>SCSI:</b> HDI-30		<b>Freq Range:</b> 50-60 Hz																					
<b>L2 Cache:</b> 512K (233)/1MB (266/300)		<b>Geoports:</b> 1		<b>Battery Type:</b> 49 Wh Lithium Ion																					
<b>2nd Processor:</b> none		<b>Ethemet:</b> 10Base-T		<b>Soft Power:</b> yes																					
<b>Slots:</b> 2 Type II PC Card (1 Type III)		<b>FireWire:</b>																							
<b>Notes:</b> Slots: PC Cards slots for two Type II PC Cards or one Type II card or CardBus cards Backside bus speed 146MHz		<b>Mic Type:</b> PlainTalk																							
		<b>AirPort Ready:</b>																							
		<b>Other Ports:</b> Printer, Modem, Speaker, Headphone,																							
<b>Memory</b>		<b>Video Memory</b>																							
<b>Logic Board:</b> none		<table><tr><th colspan="2">Video Memory</th></tr><tr><th>Resolution</th><th>built-in LCD (4MB VRAM) (built-in)</th></tr><tr><td>512 x 384</td><td>n/a-bit</td></tr><tr><td>640 x 400</td><td>24-bit</td></tr><tr><td>640 x 480</td><td>n/a-bit</td></tr><tr><td>800 x 600</td><td>24-bit</td></tr><tr><td>832 x 624</td><td>n/a-bit</td></tr><tr><td>1024 x 768</td><td>24-bit</td></tr><tr><td>1152 x 870</td><td>n/a-bit</td></tr><tr><td>1280 x 1024</td><td>n/a-bit</td></tr></table>				Video Memory		Resolution	built-in LCD (4MB VRAM) (built-in)	512 x 384	n/a-bit	640 x 400	24-bit	640 x 480	n/a-bit	800 x 600	24-bit	832 x 624	n/a-bit	1024 x 768	24-bit	1152 x 870	n/a-bit	1280 x 1024	n/a-bit
Video Memory																									
Resolution	built-in LCD (4MB VRAM) (built-in)																								
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<b>Min RAM Speed:</b> 100 MHz																									
<b>RAM Sizes:</b> 32MB, 64MB, 128 MB																									
<b>Install in Groups of:</b> 1																									
<b>Notes:</b> Two SO-DIMM slots support to 192MB 144-pin SDRAM 128 MB DIMM installs in top slot only																									
<b>Physical</b>		<b>Software</b>		<b>Storage</b>																					
<b>Introduced:</b> 9/1/1998		<b>Addressing Modes:</b> 32-bit		<b>Floppy Size:</b> 1.44MB																					
<b>Discontinued:</b> n/a		<b>Orig SSW:</b> 8.1		<b>Floppy Inject:</b> manual																					
<b>Form Factor:</b> PowerBook G3 Series		<b>Orig Enabler:</b> PowerBook G3 Series 1.1		<b>Min. Int HD Size:</b> 2, 4, 8 GB																					
<b>Gestalt ID:</b> 312		<b>ROM ID:</b> n/a		<b>Int HD Interface:</b> IDE																					
<b>Weight (lbs):</b> 7.8		<b>ROM Ver:</b> n/a		<b>Orig CD Speed:</b> 20x, DVD																					
<b>Dimensions (in):</b> 2 H x 12.7 W x 10.4 D		<b>ROM Size:</b> 4 MB		<b>Int CD Support:</b> yes																					
<b>Notes:</b> Family Model # M4753 Weight includes modem, battery and CD-ROM module		<b>AppleTalk Ver:</b> n/a		<b>Notes:</b> DVD-ROM Drive available CD-ROM and Floppy are removable modules																					
		<b>Mac OS Supported:</b> 8.1 8.5 8.6 9 X (10.2.8 or earlier)																							

Published Date: Jul 26, 2017

# MacBook (13-inch, Late 2007) - Technical Specifications

This article has been archived and is no longer updated by Apple.

	2.0GHz MacBook (MB061LL/B)	2.2GHz MacBook (MB062LL/B)	2.2GHz MacBook (MB063LL/B)
Color	White	White	Black
Processor	2.0GHz Intel Core 2 Duo	2.2GHz Intel Core 2 Duo	2.2GHz Intel Core 2 Duo
L2 cache	4MB shared	4MB shared	4MB shared
System bus	800MHz	800MHz	800MHz
Memory	1GB (two 512MB) of 667MHz DDR2 SDRAM (PC2-5300); supports up to 4GB		
Hard drive <sup>1</sup>	80GB Serial ATA; 5400 rpm	120GB Serial ATA; 5400 rpm	160GB Serial ATA; 5400 rpm
Slot-loading optical drive	Combo drive (DVD-ROM/CD-RW)	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
Graphics	Intel GMA X3100 graphics processor with 144MB of DDR2 SDRAM shared with main memory <sup>3</sup>		
Video	Built-in iSight camera; mini-DVI output port with support for DVI, VGA, S-video, and composite video (requires adapters, sold separately)		
Display	13.3-inch (diagonal) glossy TFT widescreen display, 1280 by 800 resolution		
FireWire	One FireWire 400 port (8 watts)		
USB	Two USB 2.0 ports (up to 480 Mbps)		
Audio	Built-in stereo speakers, built-in omnidirectional microphone, combined optical digital audio input/audio line in, combined optical digital audio output/headphone out		
Networking	Built-in 10/100/1000BASE-T (Gigabit) Ethernet		
Wireless	Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification) <sup>4</sup> ; built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module		
Hardware accessories	Apple Remote, 60W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery		
Limited warranty and service	Your MacBook comes with 90 days of free telephone support and a one-year limited warranty. Purchase theAppleCare Protection Plan to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.		
Apple and the global environment	Learn more about Apple’s dedication to reducing the environmental impact of our products and processes.The Apple Product Environmental Specification details the environmental attributes of our products.		
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.		

## Technical Specifications

### In the box

- MacBook
- Apple Remote
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Lithium-polymer battery
- Install/restore DVDs
- Printed and electronic documentation

### Processor and memory

- 2.0GHz or 2.2GHz Intel Core 2 Duo processor
- 4MB shared L2 cache running at full processor speed
- 800MHz frontside bus
- 1GB (two 512MB SO-DIMMs) of 667MHz DDR2 SDRAM (PC2-5300); two SO-DIMM slots support up to 4GB

### Storage

- 80GB, 120GB, or 160GB 5400-rpm Serial ATA hard disk drive; optional 120GB, 160GB, or 250GB 5400-rpm drive<sup>1</sup>
- One of the following optical drives:
  - 24x slot-loading Combo drive (DVD-ROM/CD-RW)
    - Reads DVDs at up to 8x speed
    - Writes CD-R discs at up to 24x speed
    - Writes CD-RW discs at up to 16x speed
    - Reads CDs at up to 24x speed
  - 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
    - Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
    - Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, and DVD+RW; 24x CD

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## Battery and power

- 55-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 6 hours of battery life<sup>2</sup>
- 60W MagSafe Power Adapter with cable management system
- MagSafe power adapter port

## Display

- 13.3-inch (diagonal) glossy widescreen TFT display with support for millions of colors
- Supported resolutions: 1280 by 800 (native), 1152 by 720, 1024 by 768, 1024 by 640, 800 by 600, 800 by 500, 720 by 480, and 640 by 480 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

- Intel GMA X3100 graphics processor with 144MB of DDR2 SDRAM shared with main memory<sup>3</sup>
- Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 1920 by 1200 pixels on an external display, both at millions of colors
- Built-in iSight camera
- Mini-DVI port
- DVI output using mini-DVI to DVI adapter (sold separately)
- VGA output using mini-DVI to VGA adapter (sold separately)
- Composite and S-video output using mini-DVI to video adapter (sold separately)

## Communications

- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification)<sup>4</sup>
- Built-in Bluetooth 2.0 + Enhanced Data Rate (EDR)
- Optional external Apple USB Modem

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)

## Peripheral connections

- One FireWire 400 port (up to 400 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and weight

- Height: 1.08 inches (2.75 cm)
- Width: 12.78 inches (32.5 cm)
- Depth: 8.92 inches (22.7 cm)
- Weight: 5.0 pounds (2.27 kg)

## Software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork '08 (30-day trial)

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded numeric keypad
- Solid-state scrolling trackpad for precise cursor control; supports two-finger scrolling, tap, double-tap, and drag capabilities
- Apple Remote

## Security

- Kensington cable lock slot

## Options

### Configure to order

- 120GB (5400 rpm) hard drive
- 160GB (5400 rpm) hard drive
- 250GB (5400 rpm) hard drive
- Up to 4GB of 667MHz DDR2 SDRAM
- Apple USB Modem
- Apple Mini-DVI to DVI Adapter
- Apple Mini-DVI to VGA Adapter
- Aperture

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- Final Cut Express
- Logic Express
- iWork '08

## Accessories

- AirPort Extreme Base Station
- AirPort Express Base Station
- MagSafe Airline Adapter
- Apple Mini-DVI to Video Adapter
- AppleCare Protection Plan
- .Mac Subscription
- Apple Wireless Keyboard
- Apple Keyboard

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Battery life depends on configuration and use.
3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 144MB. An additional 16MB is required when using an external display.
4. Wireless Internet access requires a base station or other wireless access point and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.

Intel and Intel Core are trademarks of Intel Corp. in the U.S. and other countries. Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

Published Date: Apr 6, 2016

# Power Macintosh G3 Desktop - Technical Specifications

## Power Macintosh G3 Desktop - Technical Specifications

Logic Board		Ports		Power	
Processor:	G3, 266MHz*	USB:		Max Watts:	230
PMMU:	integrated	ADB:	1	Amps:	8.0
FPU:	integrated	Video:	DB-15	BTU per Hr:	786.6
Data Path:	64-bit, 66Mhz	Floppy:	none	Voltage:	100-240
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	512K	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	10baseT	Soft Power:	yes
Slots:	3 PCI, 1 Comm	FireWire:		Pass Through:	yes
Notes:	*300 MHz option available	Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer, Modem, Speaker, Headphone		

Memory	
Logic Board:	none
RAM Slots:	3, 168-pin DIMM
Min - Max RAM:	32 MB - 192 MB
Min RAM Speed:	10ns
RAM Sizes:	8,16,32,64,128 MB
Install in Groups of:1	

Video Memory			
Resolution	Video Memory 2MB SGRAM (2x1MB)	Video Memory 4MB SGRAM (4x1MB)	Video Memory 6MB SGRAM (6x1MB)
512 x 384	32-bit	32-bit	32-bit
640 x 400	32-bit	32-bit	32-bit
640 x 480	32-bit	32-bit	32-bit
800 x 600	24-bit	32-bit	32-bit
832 x 624	24-bit	32-bit	32-bit
1024 x 768	16-bit	32-bit	32-bit
1152 x 870	16-bit	32-bit	32-bit
1280 x 1024	8-bit	16-bit	32-bit
Notes: Supports resolutions up to 1600x1200			

Physical		Software		Storage	
Introduced:	11/15/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	1/1/1999	Orig SSW:	8.0	Floppy Inject:	manual
Form Factor:	PM G3	Orig Enabler:		Min. Int HD Size:	4GB
Gestalt ID:	510	ROM ID:	\$0770	Int HD Interface:	IDE
Weight (lbs):	22	ROM Ver:	1917	Orig CD Speed	24x
Dimensions (in):	6.3 H x 14.4 W x 16.9 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.2		

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	Mac OS Supported:	8.1 8.0 8.5 8.5.1 8.6 9 X (10.2.8 or earlier)	
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Published Date: Jul 26, 2017



# iMac (333 MHz) - Technical Specifications

## iMac (333 MHz) - Technical Specifications

Logic Board		Ports		Power	
Processor:	G3, 333 MHz	USB:	2 yes	Max Watts:	80
PMMU:	integrated	ADB:	n/a	Amps:	1.7
FPU:	integrated	Video:	none	BTU per Hr:	273.6
Data Path:	,	Floppy:	none	Voltage:	100-240
L1 Cache:	32K	SCSI:	none	Freq Range:	50-60 Hz
L2 Cache:	512K	Geoports:	none	Battery Type:	3.6V Lithium
2nd Processor:	none	Ethernet:	10/100 Base-Tx	Soft Power:	yes
Slots:	0	FireWire:			
		Mic Type:	PlainTalk		
		AirPort Ready:	No		
		Other Ports:	Modem, Speaker, Headphone,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB (onboard) (SGRAM)	Video Memory 6MB (SGRAM)	
RAM Slots:	2, SO-DIMM	512 x 384	n/a	n/a	
Min - Max RAM:	32 MB - 128 MB	640 x 400	n/a	n/a	
Min RAM Speed:	100MHz/10ns	640 x 480	32-bit	32-bit	
RAM Sizes:	16, 32, 64, 128 MB	800 x 600	32-bit	32-bit	
Install in Groups of:	1	832 x 624	n/a	n/a	
		1024 x 768	16-bit	32-bit	
		1152 x 870	n/a	n/a	
		1280 x 1024	n/a	n/a	
		Notes: 144-pin SGRAM NOTE: use only a SGRAM SO-DIMM. Do NOT use EDO DRAM or SDRAM-based video memory.			
Physical		Software		Storage	
Introduced:	4/15/1999	Addressing Modes:	32-bit	Floppy Size:	n/a
Discontinued:	10/7/1999	Orig SSW:	8.5.1	Floppy Inject:	n/a
Form Factor:	iMac	Orig Enabler:		Min. Int HD Size:	6 GB
Gestalt ID:		ROM ID:		Int HD Interface:	ATA
Weight (lbs):		ROM Ver:		Orig CD Speed	24x
Dimensions (in):	15.8 H x 15.2 W x 17.6 D	ROM Size:	1 MB*	Int CD Support:	yes
Notes:	Comes in five different colors: Strawberry, Blueberry, Grape, Lime and Tangerine.	AppleTalk Ver:	60		
		Mac OS Supported:	8.5.1 8.6 9 X		

# Apple Studio Display LCD (15") - Technical Specifications

## Apple Studio Display LCD (15") - Technical Specifications

Physical		Power	
Introduced:	5/7/1998	Max Watts:	35
Discontinued:	n/a	Amps:	n/a
Tube Size:	15"	BTU per Hr:	119.7
Viewable Size:	15.1	Voltage:	100-120/220-240□
Tube Type:	LCD	Freq Range:	50-60 Hz
Weight (lbs):	12.1		
Dimensions (in):	15 H x 15.7 W x 9.8 D		

Modes				
Mode	Resolution	Vert Rate	Horiz Rate	DPI
VESA VGA	640x480	59.5Hz	31.4689Khz	85
Mac VGA	640x480	66.7Hz	31.469kHz	
VESA VGA	640x480	72.8Hz	35kHz	
VESA VGA	640x480	75.0Hz	35.156kHz	
VGA Text	720x400	70.1Hz	37.500kHz	
VESA SVGA	800x600	56.3Hz	37.861kHz	
VESA SVGA	800x600	60.3Hz	37.879kHz	
VESA SVGA	800x600	72.2Hz	48.077kHz	
VESA SVGA	800x600	75.0Hz	48.363kHz	
Mac 16"	832x624	74.6Hz	48.875kHz	
VESA XGA	1024x768	60.0Hz	49.725kHz	
VESA XGA	1024x768	70.1Hz	56.476kHz	
Mac XGA	1024x768	74.9Hz	60.023kHz	
VESA XGA	1024x768 1024x768	75.0Hz	60.241kHz	

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# Power Macintosh G3 (Blue and White) - Technical Specifications

## Power Macintosh G3 (Blue and White) - Technical Specifications

Technical Specifications

Processor

- 350-, 400-, or 450-MHz PowerPC G3 processor
- 1MB backside level 2 cache on processor, running at 175, 200, or 225 MHz depending on processor speed
- 100-MHz system bus
- Integrated floating-point unit and 64K on-chip level 1 cache (32K for data and 32K for instruction)

Memory

- 64MB or 128MB of PC100 SDRAM (3.3-volt, unbuffered, 64-bit-wide, 168-pin, 100 MHz/8ns devices)
- Four DIMM slots support up to 1GB of PC100 SDRAM using the following DIMMs:
  - 32MB, 64MB, or 128MB DIMMs (64-bit-wide, 64-Mbit technology)
  - 128MB or 256MB DIMMs (64-bit-wide, 128-Mbit technology)

Graphics support

ATI RAGE 128 graphics card with 16MB of SDRAM graphics memory, which provides the following capabilities:

- 2D performance
  - 128-bit internal engine
  - Hardware acceleration of graphics and video
  - Support for up to 1,600 by 1,200-pixel resolution at 32 bits per pixel (millions of colors)
- 3D performance
  - Advanced integrated triangle setup engine
  - Single-pass multitexturing design
  - Full 32-bit-per-pixel (bpp) Z buffer and 8-bpp stencil buffer
  - Robust support of QuickDraw 3D RAVE and OpenGL

**Note:** The tables below show available resolutions, colors and maximum refresh rates (measure in Hz)

Storage\*

- One of the following:
  - 6GB Ultra ATA hard disk
  - 12GB Ultra ATA hard disk
  - 9GB Ultra2 LVD SCSI hard disk with Ultra2 LVD SCSI PCI card
- 32x-speed (maximum) CD-ROM drive; or 5x-speed (maximum) DVD-ROM drive with DVD-Video playback (reads CD-ROMs at up to 32x speed)
- Zip drive (some configurations)
- Two additional expansion bays for Ultra Wide SCSI and Ultra2 LVD SCSI drives

Interfaces

- Connectivity
  - Two 400-Mbps FireWire ports
  - Two 12-Mbps Universal Serial Bus (USB) ports
  - Apple Desktop Bus (ADB) port (maximum current draw for all ADB devices is 500 mA.\*\***Note:** The Apple Developer Note on this product incorrectly states that the maximum current draw is 100 mA).
- Communications
  - Built-in 10/100BASE-T Ethernet connector (RJ-45)
  - Optional internal 56K modem card (supports K56flex and V.90 standards)\*\*
- Expansion
  - Four PCI slots: three 64-bit, 33-MHz slots and one 32-bit, 66-MHz slot dedicated to the ATI RAGE 128 graphics card
- Video
  - 15-pin mini D-Sub VGA connector and Macintosh-to-VGA adapter
- Sound
  - Minijacks for 16-bit stereo audio input and output; 44.1-kHz sampling rate
  - Built-in speaker

2D Display Modes

Monitor Resolution	640 x 480	800 x 600	1024 x 768	1152 x 864	1280 x 1024
256 colors	85	85	85	75	75
Thousands	85	85	85	75	75
Millions	85	85	85	75	75

Maximum 3D Resolutions

16MB	
Thousands	up to 1600 x 1200
Millions	up to 1280 x 1024

Electrical requirements

- Line voltage: 115V AC (90V to 132V AC) or 230V AC (180V to 264V AC)
- Frequency: 47 to 63 Hz, single phase
- Maximum continuous power (not including display): 200W

Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 10% to 90% noncondensing
- Maximum altitude: 10,000 feet (3,048 m)

Keyboard and mouse

- Apple USB Keyboard and Apple USB Mouse

Size and weight

- Height: 17.0 inches (43.2 cm)
- Width: 8.9 inches (22.6 cm)
- Depth: 18.4 inches (46.7 cm)
- Weight: 28.7 pounds (13.0 kg)\*\*\*

\* Storage devices and number of available expansion bays vary among configurations; see Available Configurations chart for details. Other configurations are available as build-to-order options from the Apple Store

\*\* Data speeds up to 56 Kbps, fax speeds up to 14.4 Kbps. Actual download speeds vary with line conditions and your Internet service provider's modem capabilities. FCC regulations limit ISP transmission speeds to 53 Kbps in the U.S.

\*\*\* Varies depending on configuration. Example includes CD-ROM drive, Zip drive, and Ultra ATA hard disk.

# Power Macintosh G3 All-In-One - Technical Specifications

## Power Macintosh G3 All-In-One - Technical Specifications

Logic Board		Ports		Power	
Processor:	G3, 233/266	USB:	None	Max Watts:	300
PMMU:	integrated	ADB:	1	Video:	none
FPU:	integrated	Floppy:	HDI-20	Amps:	
Data Path:	64-bit, 66Mhz	SCSI:	DB-25	BTU per Hr:	1026
L1 Cache:	32K	Geoports:	1	Voltage:	90-264
L2 Cache:	512K	Ethernet:	10Base-T	Freq Range:	50-60 Hz
2nd Processor:	none	FireWire:	None	Battery Type:	3.6V Lithium
Slots:	3 PCI	Mic Type:	Internal	Soft Power:	yes
		AirPort Ready:	No		
		Other Ports:	Printer, Modem, Speaker, Headphone		

Memory	
Logic Board:	none
RAM Slots:	3, 168-pin DIMM
Min - Max RAM:	32 MB - 384 MB
Min RAM Speed:	10ns
RAM Sizes:	8, 16, 32, 64, 128 MB
Install in Groups of:	1

Video Memory	
Resolution	Video Memory
512 x 384	n/a
640 x 400	n/a
640 x 480	n/a
800 x 600	n/a
832 x 624	n/a
1024 x 768	n/a
1152 x 870	n/a
1280 x 1024	n/a
Notes: *Built-in Video Display: Multiple-scan, titl-and-swivel color display; 15-in. (13.8 in. diagonal viewable image size), .28mm Dot Pitch	

Physical		Software		Storage	
Introduced:	4/3/1998	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	1/1/1999	Orig SSW:	8.0	Floppy Inject:	manual
Form Factor:	PM G3	Orig Enabler:		Min. Int HD Size:	4GB
Gestalt ID:	510	ROM ID:		Int HD Interface:	ATA
Weight (lbs):	59.5	ROM Ver:		Orig CD Speed	24x
Dimensions (in):	19.92 H br>x 16.08 W x 18 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:			

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	Mac OS Supported:	8.1 8.0 8.5 8.5.1 8.6 9 X (10.2.8 or earlier)	
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# Apple Studio Display 15-inch LCD (rev.B) - Technical Specifications

## Apple Studio Display 15-inch LCD (rev.B) - Technical Specifications

### INFO

Marketing Number: M6356xx/B

Date Introduced: January 5, 1999

Date Discontinued: December 2, 1999

### DISPLAY

Display type: LCD

Screen type: Thin film transistor (TFT) active-matrix liquid crystal display (AMLCD)

Screen size: 15.1 diagonal viewable

Native Resolution: 1024 x 768 (60, 70 or 75 Hz)

Other Resolutions: 832 x 624 (75 Hz)

800 x 600 (56, 72 or 75 Hz)

720 x 400 (70 Hz)

640 x 480 (60, 67, 72 or 75 Hz)

Maximum Colors: 16 million

Brightness

(candelas per meter squared): 200

Contrast Ratio: 200:1

### PORTS

Display connector: VGA

Serial (USB or ADB): 2 ADB ports (back of desktop stand)

FireWire: no

Video In/Out: S-video and composite inputs

Audio In/Out: RCA (2) input, mini-stereo output

### BUTTONS

Power: yes

Brightness: yes

Other Buttons: On-screen display (OSD) on/off

OSD navigation

OSD functions

Graphics/video toggle

Reset

### POWER

Maximum Power / Energy Saver Mode: <35W

### SYSTEM REQUIREMENTS

Minimum Mac hardware: PowerPC processor

Minimum Mac OS: OS 8.0 or later

Windows-compatible: Windows 95/NT

Published Date: Jul 26, 2017

# iMac - Technical Specifications

## iMac - Technical Specifications

Logic Board	Ports	Power																											
Processor: G3, 233 MHz PMMU: integrated FPU: integrated Data Path: , L1 Cache: 32K L2 Cache: 512K 2nd Processor: none Slots: 0 Notes: 512k backside cache memory	USB: 2 yes ADB: n/a Video: none Floppy: none SCSI: none Geoports: none Ethernet: 10/100 Base-Tx FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Modem, Speaker, Headphone, Sound Notes: built-in stereo speakers with SRS 3D stereo sound	Max Watts: 80 Amps: 1.7 BTU per Hr: 273.6 Voltage: 100-240 Freq Range: 50-60 Hz Battery Type: 3.6V Lithium Soft Power: yes																											
Memory	Video Memory																												
Logic Board: none RAM Slots: 2, SO-DIMM Min - Max RAM: 32 MB - 128 MB Min RAM Speed: 100MHz/10ns RAM Sizes: 16, 32, 64, 128 MB Install in Groups of: 1 Notes: 144-pin SDRAM M6709LL/A ; 32MB - 128MB M6709LL/B ; 32MB - 256MB	<table> <tr> <th>Resolution</th><th>Video Memory 2MB (onboard) (SGRAM)</th><th>Video Memory 6MB (SGRAM)</th></tr> <tr> <td>512 x 384</td><td>n/a</td><td>n/a</td></tr> <tr> <td>640 x 400</td><td>n/a</td><td>n/a</td></tr> <tr> <td>640 x 480</td><td>32-bit</td><td>32-bit</td></tr> <tr> <td>800 x 600</td><td>32-bit</td><td>32-bit</td></tr> <tr> <td>832 x 624</td><td>n/a</td><td>n/a</td></tr> <tr> <td>1024 x 768</td><td>16-bit</td><td>32-bit</td></tr> <tr> <td>1152 x 870</td><td>n/a</td><td>n/a</td></tr> <tr> <td>1280 x 1024</td><td>n/a</td><td>n/a</td></tr> </table>	Resolution	Video Memory 2MB (onboard) (SGRAM)	Video Memory 6MB (SGRAM)	512 x 384	n/a	n/a	640 x 400	n/a	n/a	640 x 480	32-bit	32-bit	800 x 600	32-bit	32-bit	832 x 624	n/a	n/a	1024 x 768	16-bit	32-bit	1152 x 870	n/a	n/a	1280 x 1024	n/a	n/a	Notes: 144-pin SGRAM NOTE: use only a SGRAM SO-DIMM. Do NOT use EDO DRAM or SDRAM-based video memory.
Resolution	Video Memory 2MB (onboard) (SGRAM)	Video Memory 6MB (SGRAM)																											
512 x 384	n/a	n/a																											
640 x 400	n/a	n/a																											
640 x 480	32-bit	32-bit																											
800 x 600	32-bit	32-bit																											
832 x 624	n/a	n/a																											
1024 x 768	16-bit	32-bit																											
1152 x 870	n/a	n/a																											
1280 x 1024	n/a	n/a																											
Physical	Software	Storage																											
Introduced: 8/15/1998 Discontinued: n/a Form Factor: iMac Gestalt ID: 406 Weight (lbs): 40 Dimensions (in): 15.8 H x 15.2 W x 17.6 D Notes: IrDA infrared link module 4 Mb/s transfer rate; range = 2 inches to 1 meter	Addressing Modes: 32-bit Orig SSW: 8.1/8.5 Orig Enabler: 462 ROM ID: 77D ROM Ver: 44F1 ROM Size: 1 MB* AppleTalk Ver: 60 Mac OS Supported: 8.1, 8.5, 8.6, 9, X Notes: *uses 3MB of RAM for toolbox ROM	Floppy Size: none Floppy Inject: none Min. Int HD Size: 4 GB Int HD Interface: ATA Orig CD Speed: 24x Int CD Support: yes Notes: Keyboard, Mouse have USB interface Supports ATA CD-ROM																											

# iMac (266 MHz) - Technical Specifications

## iMac (266 MHz) - Technical Specifications

Logic Board		Ports		Power	
Processor:	G3, 266 MHz	USB:	yes	Max Watts:	80
PMMU:	integrated	ADB:	none	Amps:	1.7
FPU:	integrated	Video:	none	BTU per Hr:	273.6
Data Path:	,	Floppy:	none	Voltage:	100-240
L1 Cache:	32kb	SCSI:	none	Freq Range:	50-60 Hz
L2 Cache:	512kb	Geoports:	none	Battery Type:	lithium
2nd Processor:	none	Ethernet:	10/100 Base-Tx		
Slots:	0	FireWire:			
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Modem, Speaker, Headphone,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB (onboard) (SGRAM)	Video Memory 6MB (SGRAM)	
RAM Slots:	2, SO-DIMM	512 x 384	n/a	n/a	
Min - Max RAM:	32 MB - 128 MB	640 x 400	n/a	n/a	
Min RAM Speed:	100MHz/10ns	640 x 480	32-bit	32-bit	
RAM Sizes:	16, 32, 64, 128 MB	800 x 600	32-bit	32-bit	
Install in Groups of:	1	832 x 624	n/a	n/a	
		1024 x 768	16-bit	32-bit	
		1152 x 870	n/a	n/a	
		1280 x 1024	n/a	n/a	
		Notes: 144-pin SGRAM NOTE: use only a SGRAM SO-DIMM. Do NOT use EDO DRAM or SDRAM-based video memory.			
Physical		Software		Storage	
Introduced:	1/5/1999	Addressing Modes:	32-bit	Floppy Size:	none
Discontinued:	4/15/1999	Orig SSW:	8.5.1	Floppy Inject:	n/a
Form Factor:	iMac	Orig Enabler:		Min. Int HD Size:	6 GB
Gestalt ID:		ROM ID:		Int HD Interface:	ATA
Weight (lbs):	40	ROM Ver:		Orig CD Speed	24x
Dimensions (in):	15.8 H x 15.2 W x 17.6 D	ROM Size:	1MB*	Int CD Support:	yes
Notes:	Comes in five different colors: Strawberry, Blueberry, Grape, Lime and Tangerine.	AppleTalk Ver:	60		
		Mac OS Supported:			



# Apple Studio Display 21 - Technical Specifications

## Apple Studio Display 21 - Technical Specifications

Physical		Power	
Introduced:	1/5/1999	Max Watts:	180
Discontinued:	n/a	Amps:	3.0
Tube Size:	21"	BTU per Hr:	615.6
Viewable Size:	19.8	Voltage:	90-132/198-264
Tube Type:	Trinitron	Freq Range:	47-63 Hz
Weight (lbs):	77		
Dimensions (in):	22.3 H x 20.1 W x 21.7 D		

Modes			
Mode	Resolution	Vert Rate	Horiz Rate
VGA	640 x 480	60Hz	31.47kHz
Mac	640 x 480	67Hz	35.04kHz
VGA	640 x 480	85Hz	37.5kHz
VESA	800 x 600	85Hz	53.67kHz
Mac	832 x 624	75Hz	49.7kHz
Mac	1024 x 768	75Hz	60.02kHz
VESA	1024 x 768	85Hz	68.68kHz
Mac	1152 x 870	75Hz	68.70kHz
VESA	1280 x 1024	75Hz	79.98kHz
VESA	1280 x 1024	85Hz	91.15kHz
VESA	1600 x 1200	75Hz	93.75kHz
VESA	1600 x 1200	85Hz	106.25kHz

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# MacBook Pro (Late 2007, 2.4/2.2GHz) - Technical Specifications

This article has been archived and is no longer updated by Apple.

	15.4-inch: 2.2GHz(MA895LL/A)	15.4-inch: 2.4GHz(MA896LL/A)	17-inch: 2.4GHz(MA897LL/A)
<b>Display</b>	15.4-inch (diagonal), 1440 by 900 resolution, TFT widescreen		17-inch (diagonal), 1680 by 1050 resolution, TFT widescreen
<b>Processor</b>	2.2GHz Intel Core 2 Duo	2.4GHz Intel Core 2 Duo	
<b>Memory</b>	2GB (two SO-DIMMs) 667MHz DDR2 SDRAM (PC2-5300)		
<b>PCI Express graphics</b>	NVIDIA GeForce 8600M GT with 128MB of GDDR3 SDRAM and dual-link DVI	NVIDIA GeForce 8600M GT with 256MB of GDDR3 SDRAM and dual-link DVI	
<b>Hard disk drive<sup>3</sup></b>	120GB Serial ATA; 5400 rpm	160GB Serial ATA; 5400 rpm	
<b>Slot-loading optical drive</b>	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)		
<b>Expansion</b>	One FireWire 400, one FireWire 800, two USB 2.0 ports, and ExpressCard/34 slot		One FireWire 400, one FireWire 800, three USB 2.0 ports, and ExpressCard/34 slot
<b>Video</b>	Built-in iSight camera, DVI, VGA (DVI to VGA adapter included)		
<b>Audio</b>	Combined optical digital input/audio line in, combined optical digital output/headphone out, stereo speakers, microphone		
<b>Ethernet</b>	Built-in 10/100/1000BASE-T (Gigabit)		
<b>Wireless<sup>2</sup></b>	Built-in AirPort Extreme (802.11n); built-in Bluetooth 2.0+EDR		
<b>Modem</b>	Apple USB Modem (sold separately)		
<b>Input</b>	Apple Remote; full-size, illuminated keyboard with ambient light sensor; scrolling trackpad		
<b>Weight<sup>4</sup></b>	5.4 pounds		6.8 pounds
<b>Footprint</b>	14.1 by 9.6 inches		15.4 by 10.4 inches
<b>Thickness</b>	1.0 inch		
<b>Video accessories</b>	DVI to VGA adapter (other adapters sold separately)		
<b>Hardware accessories</b>	85W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery		
<b>Limited warranty and service</b>	Your MacBook Pro comes with 90 days of telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.		
<b>Apple and the global environment</b>	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.		
<b>Recycling</b>	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.		

## In the box

- MacBook Pro
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Lithium-polymer battery
- Apple Remote
- DVI to VGA adapter
- Install/restore DVDs
- Printed and electronic documentation

## Processor and memory

- 15-inch MacBook Pro
  - 2.2GHz, 2.4GHz, or 2.6GHz Intel Core 2 Duo processor, 4MB on-chip shared L2 cache running 1:1 with processor speed
- 17-inch MacBook Pro
  - 2.4GHz or 2.6GHz Intel Core 2 Duo processor, 4MB on-chip shared L2 cache running 1:1 with processor speed
- 2GB (two SO-DIMMs) of PC2-5300 (667MHz) DDR2 memory; two SO-DIMM slots support up to 4GB

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- 800MHz frontside bus

## Expansion

- One FireWire 400 port at up to 400 Mbps
- One FireWire 800 port at up to 800 Mbps
- 15-inch MacBook Pro
  - Two 480-Mbps USB 2.0 ports
- 17-inch MacBook Pro
  - Three 480-Mbps USB 2.0 ports
- ExpressCard/34 slot

## Security

- Kensington cable lock slot

## Battery and power

- 15-inch MacBook Pro
  - 60-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 6 hours of battery life<sup>1</sup>
- 17-inch MacBook Pro
  - 68-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 5.75 hours of battery life<sup>1</sup>
- 85W MagSafe Power Adapter with cable management system
- MagSafe power adapter port

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking (based on an IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible<sup>2</sup>
- Built-in Bluetooth 2.0+EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Combined optical digital input/audio line in (minijack)
- Combined optical digital output/headphone out (minijack)
- Built-in stereo speakers
- Internal omnidirectional microphone (located under left speaker grille)

## Display

- 15-inch MacBook Pro
  - 15.4-inch (diagonal) TFT LED backlit display with support for millions of colors; optional glossy widescreen display
  - Supported resolutions: 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio; 720 by 480 at 3:2 aspect ratio stretched
- 17-inch MacBook Pro
  - 17-inch (diagonal) TFT display with support for millions of colors; optional glossy widescreen display
  - Supported resolutions: 1680 by 1050 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1280 by 1024 at 5:4 aspect ratio; 1280 by 1024 at 5:4 aspect ratio stretched; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio; 720 by 480 at 3:2 aspect ratio stretched
  - Optional 17-inch (diagonal) TFT widescreen display with support for millions of colors; optional glossy widescreen display. Supported resolutions: 1920 by 1200 (native), 1680 by 1050, 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1280 by 1024 at 5:4 aspect ratio; 1280 by 1024 at 5:4 aspect ratio stretched; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio; 720 by 480 at 3:2 aspect ratio stretched

## Video and graphics support

- 15-inch MacBook Pro
  - NVIDIA GeForce 8600M GT graphics processor with dual-link DVI support; 128MB of GDDR3 SDRAM on 2.2GHz configuration; 256MB of GDDR3 SDRAM on 2.4GHz and 2.6GHz configurations
- 17-inch MacBook Pro
  - NVIDIA GeForce 8600M GT graphics processor with dual-link DVI support and 256MB of GDDR3 SDRAM

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- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- DVI output port
- VGA output using included DVI to VGA adapter
- Built-in iSight camera

## Storage

- 15-inch MacBook Pro
  - 120GB or 160GB 5400-rpm Serial ATA hard drive; optional 200GB 7200-rpm or 250GB 5400-rpm drive<sup>3</sup>
  - 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
    - Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
    - Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD
- 17-inch MacBook Pro
  - 160GB 5400-rpm Serial ATA hard drive; optional 200GB 7200-rpm or 250GB 5400-rpm drive<sup>3</sup>
  - 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
    - Maximum write: 8x DVD-R, DVD+R, DVD+RW; 6x DVD-RW; 4x DVD-R DL (double layer), DVD+R DL (double layer); 24x CD-R; 16x CD-RW
    - Maximum read: 8x DVD-R, DVD+R, DVD+RW, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW; 24x CD

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement), and embedded numeric keypad
  - Backlit keyboard with ambient light sensors for automatic adjustment of keyboard illumination and screen brightness
- Solid-state scrolling trackpad for precise cursor control; supports two-finger scrolling, tap, double-tap, and drag capabilities
- Apple Remote

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- DC input: 18.5 Vdc, 4.6A maximum
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and weight

- 15-inch MacBook Pro
  - Height: 1.0 inch (2.59 cm)
  - Width: 14.1 inches (35.7 cm)
  - Depth: 9.6 inches (24.3 cm)
  - Weight: 5.4 pounds (2.45 kg) with battery and optical drive installed<sup>4</sup>
- 17-inch MacBook Pro
  - Height: 1.0 inch (2.59 cm)
  - Width: 15.4 inches (39.2 cm)
  - Depth: 10.4 inches (26.5 cm)
  - Weight: 6.8 pounds (3.08 kg) with battery and optical drive installed<sup>4</sup>

## Software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork '08 (30-day trial), Aperture Trial

## Options

- Apple USB Modem
- Apple Wireless Keyboard
- Apple Keyboard
- Apple wireless Mighty Mouse
- Apple Mighty Mouse
- AppleCare Protection Plan

## Online store options

- Up to 4GB main memory
- 160GB 5400-rpm, 200GB 7200-rpm hard drive; 250GB 5400-rpm hard drive;<sup>3</sup>
- AirPort Extreme Base Station
- AirPort Express
- Apple DVI to Base Station Video Adapter
- Apple 85W MagSafe Power Adapter
- MagSafe Airline Adapter
- Rechargeable Battery, 15-inch MacBook Pro
- Rechargeable Battery, 17-inch MacBook Pro
- World Travel Adapter Kit
- iWork '08

- 
1. Battery life depends on configuration and use.
  2. Wireless Internet access requires base station or other wireless access point and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.
  3. 1GB = 1 billion bytes; actual formatted capacity less.
  4. Actual weight varies by configuration and manufacturing process.

Published Date: Apr 6, 2016

# Macintosh Portable: Technical Specifications

## Macintosh Portable

Logic Board	Ports	Power
Processor: 68000, 16	USB:	Max Watts: 5
PMMU: none	ADB: 1	Amps: .13
FPU: none	Video: HDI-15	BTU per Hr: 17.1
Data Path: 16, 16	Floppy: DB-19	Voltage: 70-270
L1 Cache: none	SCSI: DB-25	Freq Range: 48-62 Hz
L2 Cache: none	Geoports:	Battery Type: lead acid
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: modem	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 1 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, Portable	512 x 384	n/a-bit
Min - Max RAM: 1MB - 8 MB	640 x 400	1-bit
Min RAM Speed: 100	640 x 480	n/a-bit
RAM Sizes: 1-8 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Some systems have a backlit screen.	
Physical	Software	Storage
Introduced: 9/20/1989	Addressing Modes: 24-bit	Floppy Size: 1.44MB
Discontinued: 10/21/1991	Orig SSW: 6.0.4	Floppy Inject: auto
Form Factor: Portable	Orig Enabler: none	Min. Int HD Size: 0-40MB
Gestalt ID: 10	ROM ID: \$0378	Int HD Interface: SCSI
Weight (lbs): 15.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 4.05 H x 15.25 W x 14.83 D	ROM Size: 256K	Int CD Support:
Notes: Support Discontinued 9/1/98	AppleTalk Ver: 52	
	Mac OS Supported: 6.0.5 6.0.7 6.0.8 7.0 7.0.1 7.1 7.1.1 (Pro) 7.5 6.0.4 7.5.1 7.5.3 7.5.5	

# Macintosh PowerBook 100: Technical Specifications

## Macintosh PowerBook 100

Logic Board		Ports	Power
Processor:	68000, 16	USB:	Max Watts: 17
PMMU:	none	ADB:	Amps: 2
FPU:	none	Video:	BTU per Hr: 58.14
Data Path:	16, 16	Floppy:	Voltage: 100-240
L1 Cache:	none	SCSI:	Freq Range: 50-60 Hz
L2 Cache:	none	Geoports:	Battery Type: PB100, lead acid
2nd Processor:	none	Ethernet:	Soft Power: yes
Slots:	modem	FireWire:	
		Mic Type:	
		AirPort Ready:	
		Other Ports:	Printer Speaker ,
Memory		Video Memory	
Logic Board:	2 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots:	1, PB1xx	512 x 384	n/a-bit
Min - Max RAM:	2 MB - 8 MB	640 x 400	1-bit
Min RAM Speed:	100	640 x 480	n/a-bit
RAM Sizes:	2, 4, 6 MB	800 x 600	n/a-bit
Install in Groups of:	1	832 x 624	n/a-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
Physical		Software	Storage
Introduced:	10/21/1991	Addressing Modes:	Floppy Size: none
Discontinued:	8/3/1992	Orig SSW:	Floppy Inject: n/a
Form Factor:	PowerBook 100	Orig Enabler:	Min. Int HD Size: 20-40MB
Gestalt ID:	24	ROM ID:	Int HD Interface: SCSI
Weight (lbs):	5.1	ROM Ver:	Orig CD Speed: n/a
Dimensions (in):	1.8 H x 11 W x 8.5 D	ROM Size:	Int CD Support:
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	
		Mac OS Supported:	
		7.0.1	
		7.1	
		7.1.1 (Pro)	
		7.5	
		7.5.1	
		7.5.3	
		7.5.5	

# Macintosh PowerBook 140: Technical Specifications

## Macintosh PowerBook 140

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	17
PMMU:	integrated	ADB:	1	Amps:	2
FPU:	none	Video:	none	BTU per Hr:	58.14
Data Path:	32, 16	Floppy:	none	Voltage:	100-240
L1 Cache:	0.5K	SCSI:	HDI-30	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	PB1XX, NiCd
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	modem	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	2 MB	Resolution	Video Memory built-in LCD screen (built in)		
RAM Slots:	1, PB1xx	512 x 384	n/a-bit		
Min - Max RAM:	2 MB - 8 MB	640 x 400	1-bit		
Min RAM Speed:	100	640 x 480	n/a-bit		
RAM Sizes:	2, 4, 6 MB	800 x 600	n/a-bit		
Install in Groups of:	1	832 x 624	n/a-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	10/21/1991	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	8/3/1992	Orig SSW:	7.0.1	Floppy Inject:	auto
Form Factor:	PowerBook 140	Orig Enabler:	none	Min. Int HD Size:	40-80MB
Gestalt ID:	25	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	6.8	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	2.25 H x 11.25 W x 9.3 D	ROM Size:	1MB	Int CD Support:	
		AppleTalk Ver:	56.0.2		
		Mac OS Supported:	7.0.1 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1		



# Macintosh PowerBook 145: Technical Specifications

## Macintosh PowerBook 145

Logic Board	Ports	Power
Processor: 68030, 25	USB:	Max Watts: 17
PMMU: integrated	ADB: 1	Amps: 2
FPU: none	Video: none	BTU per Hr: 58.14
Data Path: 32, 25	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB1XX, NiCd
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: modem	FireWire:	
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 2 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, PB1xx	512 x 384	n/a-bit
Min - Max RAM: 2 MB - 8 MB	640 x 400	1-bit
Min RAM Speed: 100	640 x 480	n/a-bit
RAM Sizes: 2, 4, 6 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 8/3/1992	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 6/7/1993	Orig SSW: 7.0.1	Floppy Inject: manual
Form Factor: PowerBook 140	Orig Enabler: none	Min. Int HD Size: 40-80MB
Gestalt ID: 54	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 6.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.25 H x 11.25 W x 9.3 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 56.0.2	
	Mac OS Supported: 7.0.1 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1	

# Macintosh PowerBook 145B: Technical Specifications

## Macintosh PowerBook 145B

Logic Board		Ports	Power
Processor:	68030, 25	USB:	Max Watts: 17
PMMU:	integrated	ADB:	Amps: 2
FPU:	none	Video:	BTU per Hr: 58.14
Data Path:	32, 25	Floppy:	Voltage: 100-240
L1 Cache:	0.5K	SCSI:	Freq Range: 50-60 Hz
L2 Cache:	none	Geoports:	Battery Type: PB1XX, NiCd
2nd Processor:	none	Ethernet:	Soft Power: yes
Slots:	modem	FireWire:	
		Mic Type:	Omni
		AirPort Ready:	
		Other Ports:	Printer Modem Speaker ,
Memory		Video Memory	
Logic Board:	4 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots:	1, PB1xx	512 x 384	n/a-bit
Min - Max RAM:	4 MB - 8 MB	640 x 400	1-bit
Min RAM Speed:	100	640 x 480	n/a-bit
RAM Sizes:	2, 4 MB	800 x 600	n/a-bit
Install in Groups of:	1	832 x 624	n/a-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
Physical		Software	Storage
Introduced:	6/7/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued:	7/18/1994	Orig SSW:	7.1
Form Factor:	PowerBook 140	Orig Enabler:	none
Gestalt ID:	54	ROM ID:	\$067C
Weight (lbs):	6.8	ROM Ver:	n/a
Dimensions (in):	2.25 H x 11.25 W x 9.3 D	ROM Size:	1MB
		AppleTalk Ver:	57.0.4
		Mac OS Supported:	7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1
			Int HD Interface: SCSI
			Orig CD Speed n/a
			Int CD Support:

# Macintosh PowerBook 150: Technical Specifications

## Macintosh PowerBook 150

Logic Board	Ports	Power
Processor: 68030, 33	USB:	Max Watts: 17
PMMU: integrated	ADB:	Amps: 2
FPU: none	Video: none	BTU per Hr: 58.14
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB1XX, NiCd
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: modem	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, Duo	512 x 384	n/a-bit
Min - Max RAM: 4 MB - 40 MB	640 x 400	2-bit
Min RAM Speed: 70	640 x 480	n/a-bit
RAM Sizes: 4, 8, 20, 36 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 7/18/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 10/14/1995	Orig SSW: 7.1.1	Floppy Inject: manual
Form Factor: PowerBook 140	Orig Enabler: PowerBook 150 Enabler	Min. Int HD Size: 120-250MB
Gestalt ID: 115	ROM ID: \$067C	Int HD Interface: IDE
Weight (lbs): 5.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.25 H x 11.25 W x 9.3 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1.1 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1	

# Macintosh PowerBook 160: Technical Specifications

## Macintosh PowerBook 160

Logic Board		Ports	Power
Processor:	68030, 25	USB:	Max Watts: 17
PMMU:	integrated	ADB:	Amps: 2
FPU:	none	Video:	BTU per Hr: 58.14
Data Path:	32, 25	Floppy:	Voltage: 100-240
L1 Cache:	0.5K	SCSI:	Freq Range: 50-60 Hz
L2 Cache:	none	Geoports:	Battery Type: PB1XX, NiCd
2nd Processor:	none	Ethernet:	Soft Power: yes
Slots:	modem	FireWire:	
		Mic Type:	Omni
		AirPort Ready:	
		Other Ports:	Printer Modem Speaker ,
Memory		Video Memory	
Logic Board:	4 MB	Resolution	Video Memory built-in LCD screen 512K VRAM (ext.) (built in)
RAM Slots:	1, PB1xx		
Min - Max RAM:	4 MB - 14 MB		
Min RAM Speed:	85		
RAM Sizes:	2, 4, 10 MB		
Install in Groups of:	1		
		512 x 384	n/a-bit 8-bit
		640 x 400	4-bit 8-bit
		640 x 480	n/a-bit 8-bit
		800 x 600	n/a-bit 8-bit
		832 x 624	n/a-bit 8-bit
		1024 x 768	n/a-bit n/a-bit
		1152 x 870	n/a-bit n/a-bit
		1280 x 1024	n/a-bit n/a-bit
Physical		Software	Storage
Introduced:	10/19/1992	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued:	8/16/1993	Orig SSW: 7.1	Floppy Inject: manual
Form Factor:	PowerBook 140	Orig Enabler: System Enabler 111	Min. Int HD Size: 40-120MB
Gestalt ID:	34	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs):	6.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in):	2.25 H x 11.25 W x 9.3 D	ROM Size: 1MB	Int CD Support:
		AppleTalk Ver: 57.0.4	
		Mac OS	
		Supported:	
		7.1	
		7.5	
		7.1.1 (Pro)	
		7.5.1	
		7.5.3	
		7.5.5	
		7.6	
		7.6.1	

# Macintosh PowerBook 165: Technical Specifications

## Macintosh PowerBook 165

Logic Board		Ports	Power
Processor:	68030, 33	USB:	Max Watts: 17
PMMU:	integrated	ADB:	Amps: 2
FPU:	none	Video:	BTU per Hr: 58.14
Data Path:	32, 33	Floppy:	Voltage: 100-240
L1 Cache:	0.5K	SCSI:	Freq Range: 50-60 Hz
L2 Cache:	none	Geoports:	Battery Type: PB1XX, NiCd
2nd Processor:	none	Ethernet:	Soft Power: yes
Slots:	modem	FireWire:	
		Mic Type:	Omni
		AirPort Ready:	
		Other Ports:	Printer Modem Speaker
Memory		Video Memory	
Logic Board:	4 MB	Resolution	Video Memory 128K static (LCD only) Video Memory 512K VRAM (ext. only)
RAM Slots:	1, PB1xx		(built in)
Min - Max RAM:	4 MB - 14 M B	512 x 384	n/a-bit 8-bit
Min RAM Speed:	85	640 x 400	4-bit 8-bit
RAM Sizes:	2, 4, 10 MB	640 x 480	n/a-bit 8-bit
Install in Groups of:	1	800 x 600	n/a-bit 8-bit
		832 x 624	n/a-bit 8-bit
		1024 x 768	n/a-bit n/a-bit
		1152 x 870	n/a-bit n/a-bit
		1280 x 1024	n/a-bit n/a-bit
Physical		Software	Storage
Introduced:	8/16/1993	Addressing Modes:	Floppy Size: 1.44MB
Discontinued:	7/18/1994	Orig SSW:	Floppy Inject: manual
Form Factor:	PowerBook 140	Orig Enabler:	Min. Int HD Size: 80-160MB
Gestalt ID:	84	ROM ID:	Int HD Interface: SCSI
Weight (lbs):	6.8	ROM Ver:	Orig CD Speed n/a
Dimensions (in):	2.25 H x 11.25 W x 9.3 D	ROM Size:	Int CD Support:
		AppleTalk Ver:	
		Mac OS	
		Supported:	
		7.1	
		7.5	
		7.1.1 (Pro)	
		7.5.1	
		7.5.3	
		7.5.5	
		7.6	
		7.6.1	

# Macintosh PowerBook 165c: Technical Specifications

## Macintosh PowerBook 165c

Logic Board		Ports		Power	
Processor:	68030, 33	USB:		Max Watts:	24
PMMU:	integrated	ADB:	1	Amps:	3.2
FPU:	68882	Video:	mini-15	BTU per Hr:	82.08
Data Path:	32, 33	Floppy:	none	Voltage:	100-240
L1 Cache:	0.5K	SCSI:	HDI-30	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	PB1XX, NiCd
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	modem	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 128K static (LCD only) (built in)	Video Memory 512K VRAM (ext. only) (built in)	
RAM Slots:	1, PB1xx	512 x 384	n/a-bit	8-bit	
Min - Max RAM:	4 MB - 14 MB	640 x 400	8-bit	8-bit	
Min RAM Speed:	85	640 x 480	n/a-bit	8-bit	
RAM Sizes:	2, 4, 10 MB	800 x 600	n/a-bit	8-bit	
Install in Groups of:	1	832 x 624	n/a-bit	8-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	2/10/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	12/1/1993	Orig SSW:	7.1	Floppy Inject:	manual
Form Factor:	PowerBook 140	Orig Enabler:	System Enabler 121	Min. Int HD Size:	80-120MB
Gestalt ID:	50	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	7	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	2.29 H x 11.25 W x 9.3 D	ROM Size:	1MB	Int CD Support:	
		AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

# Macintosh PowerBook 170: Technical Specifications

## Macintosh PowerBook 170

Logic Board		Ports		Power	
Processor:	68030, 25	USB:		Max Watts:	17
PMMU:	integrated	ADB:	1	Amps:	2
FPU:	68882	Video:	none	BTU per Hr:	58.14
Data Path:	32, 25	Floppy:	none	Voltage:	100-240
L1 Cache:	0.5K	SCSI:	HDI-30	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	PB1XX, NiCd
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	modem	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	2 MB	Resolution	Video Memory built-in LCD screen (built in)		
RAM Slots:	1, PB1xx	512 x 384	n/a-bit		
Min - Max RAM:	2 MB - 8 MB	640 x 400	1-bit		
Min RAM Speed:	100	640 x 480	n/a-bit		
RAM Sizes:	2, 4, 6 MB	800 x 600	n/a-bit		
Install in Groups of:	1	832 x 624	n/a-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	10/21/1991	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	10/19/1992	Orig SSW:	7.0.1	Floppy Inject:	auto
Form Factor:	PowerBook 140	Orig Enabler:	none	Min. Int HD Size:	40-80MB
Gestalt ID:	21	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	6.8	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	2.25 H x 11.25 W x 9.3 D	ROM Size:	1MB	Int CD Support:	
		AppleTalk Ver:	56.0.2		
		Mac OS Supported:	7.0.1 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

# iPod nano (3rd generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

Storage/capacity	4GB (1,000 songs)	8GB (2,000 songs)
Color	Silver	Silver, Black, Blue, Green, Pink, Red
Battery life	Up to 24 hours of music playback; up to 5 hours of video playback	
Display	2-inch (diagonal) color LCD with LED backlight	
Ports	Dock connector, stereo minijack	
Connectivity	USB through dock connector; component and composite video through dock connector (with AV cables or kit, sold separately); audio through headphone jack	
Charge time	About 3 hours (1.5-hour fast charge to 80% capacity)	
Audio support	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF	
Photo support	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats	
Video support	H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats	
Size	2.75 x 2.06 x 0.26 inches (69.8 x 52.3 x 6.5 mm)	
Weight	1.74 ounces (49.2 grams)	
Included accessories	Earphones, USB cable, dock adapter	

Size and weight

- Height: 2.75 inches (69.8 mm)
- Width: 2.06 inches (52.3 mm)
- Depth: 0.26 inch (6.5 mm)
- Weight: 1.74 ounces (49.2 grams)

In the box

- iPod nano
- Earphones
- USB 2.0 cable
- Dock adapter
- Quick Start guide

Capacity

- 4GB or 8GB flash drive<sup>1</sup>
- Holds up to 1,000 or 2,000 songs in 128-Kbps AAC format<sup>2</sup>
- Holds up to 3,500 or 7,000 iPod-viewable photos<sup>3</sup>
- Holds up to 4 hours (4GB) or up to 8 hours (8GB) of video<sup>4</sup>
- Stores data via USB flash drive

Display

- 2-inch (diagonal) liquid crystal display with blue-white LED backlight
- 320-by-240-pixel resolution at 204 pixels per inch

Audio

- Skip-free playback
- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

Video

- H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

Mac system requirements



# 14\_iPod nano (3rd generation) - Technical Specifications.pdf

- Mac computer with USB 2.0 port
- Mac OS X v10.4.8 or later
- iTunes 7.4 or later<sup>5</sup>

## Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 2 or later
- iTunes 7.4 or later<sup>5</sup>

## Languages

- Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, and Turkish
- Additional language support for display of song, album, and artist information: Bulgarian, Croatian, Romanian, Serbian, Slovak, Slovenian, and Ukrainian

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Input and output

- Dock connector
- 3.5-mm stereo headphone jack

## Power and battery<sup>6</sup>

- Built-in rechargeable lithium ion battery
- Playback time
  - Music playback time: Up to 24 hours when fully charged
  - Video playback time: Up to 5 hours when fully charged
- Charging via USB to computer system or power adapter (sold separately)
  - Fast-charge time: about 1.5 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 3 hours

## Limited warranty and service

Your iPod comes with single-incident telephone support for the first 90 days and a one-year limited warranty. Purchase the AppleCare Protection Plan for iPod to extend your service and support to two full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

## Options & Accessories

Available from the Apple Online Store or an Apple Authorized Reseller.

### Accessories

iPod nano Armband (Gray) MB130G/A

Nike+iPod Sport Kit MA365LL/B

iPod Hi-Fi M9867LL/A

iPod Radio Remote MA070G/C

### Dock

Apple Universal Dock with Remote MB125G/A

Apple Universal Dock Adapter (3-pack) MB126G/A

### Headphones

In-Ear Headphones M9394G/B

### Services

AppleCare Protection Plan MA964LL/A

### Cables and adapters

Apple Component AV Cable MB128LL/A

Apple Composite AV Cable MB129LL/A

Apple USB Power Adapter MB051LL/A

Apple iPod Dock Connector to USB 2.0 Cable MA591LL/A

World Travel Adapter Kit M8794G/B

# 14\_iPod nano (3rd generation) - Technical Specifications.pdf

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Music capacity is based on 4 minutes per song and 128-Kbps AAC encoding; actual capacity varies by content.
3. Photo capacity is based on iPod-viewable photos transferred from iTunes.
4. Video capacity based on H.264 1.5-Mbps video at 640-by-480 resolution combined with 128-Kbps audio; actual capacity varies by content.
5. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.
6. Testing conducted by Apple in August 2007 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (128-Kbps AAC). Video content was purchased from the iTunes Store. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

Published Date: Apr 6, 2016

# Macintosh PowerBook 180: Technical Specifications

## Macintosh PowerBook 180

Logic Board		Ports		Power	
Processor:	68030, 33	USB:		Max Watts:	17
PMMU:	integrated	ADB:	1	Amps:	2
FPU:	68882	Video:	mini-15	BTU per Hr:	58.14
Data Path:	32, 33	Floppy:	none	Voltage:	100-240
L1 Cache:	0.5K	SCSI:	HDI-30	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	PB1XX, NiCd
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	modem	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 128K static (LCD only) (built in)	Video Memory 512K VRAM (ext. only) (built in)	
RAM Slots:	1, PB1xx				
Min - Max RAM:	4 MB - 14 MB	512 x 384	n/a-bit	8-bit	
Min RAM Speed:	85	640 x 400	4-bit	8-bit	
RAM Sizes:	2, 4, 6, 8, 10 MB	640 x 480	n/a-bit	8-bit	
Install in Groups of:	1	800 x 600	n/a-bit	8-bit	
		832 x 624	n/a-bit	8-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	10/19/1992	Addressing Modes: 24-, 32-bit		Floppy Size:	1.44MB
Discontinued:	5/1/1994	Orig SSW:	7.1	Floppy Inject:	manual
Form Factor:	PowerBook 140	Orig Enabler:	System Enabler 111	Min. Int HD Size:	80, 120MB
Gestalt ID:	33	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	6.8	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	2.25 H x 11.25 W x 9.3 D	ROM Size:	1MB	Int CD Support:	
		AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

# Macintosh PowerBook 180c: Technical Specifications

## Macintosh PowerBook 180c

Logic Board	Ports	Power
Processor: 68030, 33	USB:	Max Watts: 24
PMMU: integrated	ADB: 1	Amps: 3.2
FPU: 68882	Video: mini-15	BTU per Hr: 82.08
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB1XX, NiCd
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: modem	FireWire:	
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory built-in LCD screen 512K VRAM (ext. only) (built in)
RAM Slots: 1, PB1xx		
Min - Max RAM: 4 MB - 14 MB		
Min RAM Speed: 85		
RAM Sizes: 2, 4, 6, 8, 10 MB		
Install in Groups of: 1		
	512 x 384	n/a-bit 8-bit
	640 x 400	n/a-bit 8-bit
	640 x 480	8-bit 8-bit
	800 x 600	n/a-bit 8-bit
	832 x 624	n/a-bit 8-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 6/7/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 3/14/1994	Orig SSW: 7.1	Floppy Inject: manual
Form Factor: PowerBook 140	Orig Enabler: System Enabler 131 v1.0	Min. Int HD Size: 80-160MB
Gestalt ID: 71	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 7.1	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.34 H x 11.25 W x 9.3 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS 7.1	
	Supported: 7.5	
	7.1.1 (Pro)	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	

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# Macintosh PowerBook 190: Technical Specifications

## Macintosh PowerBook 190

Logic Board	Ports	Power
Processor: 68LC040, 66	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.88
FPU: none	Video: opt. mini-15	BTU per Hr: 153.9
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB190, NiMH
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 4, 8 MB	Video Memory Resolution built-in LCD screen (built in)	
RAM Slots: 1, PB53xx	512 x 384 n/a-bit	
Min - Max RAM: 4 MB - 36, 40 MB	640 x 400 n/a-bit	
Min RAM Speed: 70	640 x 480 4-bit	
RAM Sizes: 4-32 MB	800 x 600 n/a-bit	
Install in Groups of: 1	832 x 624 n/a-bit	
	1024 x 768 n/a-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
Physical	Software	Storage
Introduced: 8/28/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 6/15/1996	Orig SSW: 7.5.2	Floppy Inject: manual
Form Factor: PowerBook 5300	Orig Enabler: PowerBook 5300/190 Enabler v1.1	Min. Int HD Size: 500MB
Gestalt ID: 122	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 6	ROM Ver: \$2B	Orig CD Speed n/a
Dimensions (in): 2 H x 11.5 W x 8.5 D	ROM Size: 2MB	Int CD Support:
	AppleTalk Ver: 58.1.6	
	Mac OS 7.5.2	
	Supported: 7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	

# Macintosh PowerBook 190cs: Technical Specifications

## Macintosh PowerBook 190cs

Logic Board	Ports	Power
Processor: 68LC040, 66	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.88
FPU: none	Video: opt. mini-15	BTU per Hr: 153.9
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB190, NiMH
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer Speaker ,	
Memory	Video Memory	
Logic Board: 4, 8 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, PB53xx	512 x 384	n/a-bit
Min - Max RAM: 4 MB - 36, 40 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	8-bit
RAM Sizes: 4-32 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 8/28/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.2	Floppy Inject: manual
Form Factor: PowerBook 5300	Orig Enabler: PowerBook 5300/190 Enabler v1.1	Min. Int HD Size: 500MB
Gestalt ID: 122	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 6.3	ROM Ver: \$2B	Orig CD Speed n/a
Dimensions (in): 2.2 H x 11.5 W x 8.5 D	ROM Size: 2MB	Int CD Support:
	AppleTalk Ver: 58.1.6	
	Mac OS 7.5.2	
	Supported: 7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	

# Macintosh PowerBook Duo 210: Technical Specifications

## Macintosh PowerBook Duo 210

Logic Board	Ports	Power
Processor: 68030, 25	USB:	Max Watts: 25
PMMU: integrated	ADB:	Amps: 1.04
FPU: opt. in Dock	Video: none	BTU per Hr: 85.5
Data Path: 32, 25	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: none	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: Duo, NiMH Type I
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: modem, dock	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, Duo	512 x 384	n/a-bit
Min - Max RAM: 4 MB - 24 MB	640 x 400	4-bit
Min RAM Speed: 70	640 x 480	n/a-bit
RAM Sizes: 4-20 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 10/19/1992	Addressing Modes: 24-, 32-bit	Floppy Size: none
Discontinued: 10/21/1993	Orig SSW: 7.1	Floppy Inject: n/a
Form Factor: PowerBook Duo	Orig Enabler: System Enabler 201	Min. Int HD Size: 80MB
Gestalt ID: 29	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 4.2	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 1.4 H x 10.9 W x 8.5 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1	
	7.5	
	7.1.1 (Pro)	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	

# Macintosh PowerBook Duo 230: Technical Specifications

## Macintosh PowerBook Duo 230

Logic Board	Ports	Power
Processor: 68030, 33	USB:	Max Watts: 25
PMMU: integrated	ADB:	Amps: 1.04
FPU: opt. in Dock	Video: none	BTU per Hr: 85.5
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: none	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: Duo, NiMH Type I
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: modem, dock	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, Duo	512 x 384	n/a-bit
Min - Max RAM: 4 MB - 24 MB	640 x 400	4-bit
Min RAM Speed: 70	640 x 480	n/a-bit
RAM Sizes: 4-20 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 10/19/1992	Addressing Modes: 24-, 32-bit	Floppy Size: none
Discontinued: 7/18/1994	Orig SSW: 7.1	Floppy Inject: n/a
Form Factor: PowerBook Duo	Orig Enabler: System Enabler 201	Min. Int HD Size: 80-160MB
Gestalt ID: 32	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 4.2	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 1.4 H x 10.9 W x 8.5 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1	
	7.5	
	7.1.1 (Pro)	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	

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# Macintosh PowerBook Duo 250: Technical Specifications

## Macintosh PowerBook Duo 250

Logic Board	Ports	Power
Processor: 68030, 33	USB:	Max Watts: 25
PMMU: integrated	ADB:	Amps: 1.04
FPU: opt. in Dock	Video: none	BTU per Hr: 85.5
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: none	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: Duo, NiMH Type II
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: modem, dock	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer	
Memory	Video Memory	
Logic Board: 4 MB	<div>Resolution</div> <div>Video Memory built-in LCD screen (built in)</div>	
RAM Slots: 1, Duo	512 x 384 n/a-bit	
Min - Max RAM: 4 MB - 24 MB	640 x 400 4-bit	
Min RAM Speed: 70	640 x 480 n/a-bit	
RAM Sizes: 4-20 MB	800 x 600 n/a-bit	
Install in Groups of: 1	832 x 624 n/a-bit	
	1024 x 768 n/a-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
Physical	Software	Storage
Introduced: 10/21/1993	Addressing Modes: 24-, 32-bit	Floppy Size: none
Discontinued: 5/1/1994	Orig SSW: 7.1	Floppy Inject: n/a
Form Factor: PowerBook Duo	Orig Enabler: PowerBook Duo Enabler v1.0	Min. Int HD Size: 200MB
Gestalt ID: 38	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 4.2	ROM Ver: n/a	Orig CD Speed: n/a
Dimensions (in): 1.4 H x 10.9 W x 8.5 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1	
	7.5	
	7.1.1 (Pro)	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	

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# Macintosh PowerBook Duo 270c: Technical Specifications

## Macintosh PowerBook Duo 270c

Logic Board		Ports		Power																			
Processor:	68030, 33	USB:		Max Watts:	25																		
PMMU:	integrated	ADB:		Amps:	1.04																		
FPU:	68882	Video:	none	BTU per Hr:	85.5																		
Data Path:	32, 33	Floppy:	none	Voltage:	100-240																		
L1 Cache:	0.5K	SCSI:	none	Freq Range:	50-60 Hz																		
L2 Cache:	none	Geoports:		Battery Type:	Duo, NiMH Type II																		
2nd Processor:	none	Ethernet:	none	Soft Power:	yes																		
Slots:	modem, dock	FireWire:																					
		Mic Type:	none																				
		AirPort Ready:																					
		Other Ports:	Printer																				
Memory		Video Memory																					
Logic Board:	4 MB	<table><tr><td>Resolution</td><td>Video Memory built-in LCD screen (built in)</td></tr><tr><td>512 x 384</td><td>n/a-bit</td></tr><tr><td>640 x 400</td><td>16-bit</td></tr><tr><td>640 x 480</td><td>8-bit</td></tr><tr><td>800 x 600</td><td>n/a-bit</td></tr><tr><td>832 x 624</td><td>n/a-bit</td></tr><tr><td>1024 x 768</td><td>n/a-bit</td></tr><tr><td>1152 x 870</td><td>n/a-bit</td></tr><tr><td>1280 x 1024</td><td>n/a-bit</td></tr></table>				Resolution	Video Memory built-in LCD screen (built in)	512 x 384	n/a-bit	640 x 400	16-bit	640 x 480	8-bit	800 x 600	n/a-bit	832 x 624	n/a-bit	1024 x 768	n/a-bit	1152 x 870	n/a-bit	1280 x 1024	n/a-bit
Resolution	Video Memory built-in LCD screen (built in)																						
512 x 384	n/a-bit																						
640 x 400	16-bit																						
640 x 480	8-bit																						
800 x 600	n/a-bit																						
832 x 624	n/a-bit																						
1024 x 768	n/a-bit																						
1152 x 870	n/a-bit																						
1280 x 1024	n/a-bit																						
RAM Slots:	1, Duo																						
Min - Max RAM:	4 MB - 32 MB																						
Min RAM Speed:	70																						
RAM Sizes:	4-28 MB																						
Install in Groups of:	1																						
Physical		Software		Storage																			
Introduced:	10/21/1993	Addressing Modes: 24-, 32-bit		Floppy Size:	none																		
Discontinued:	5/1/1994	Orig SSW:	7.1	Floppy Inject:	n/a																		
Form Factor:	PowerBook Duo	Orig Enabler:	PowerBook Duo Enabler v1.0	Min. Int HD Size:	240MB																		
Gestalt ID:	77	ROM ID:	\$067C	Int HD Interface:	SCSI																		
Weight (lbs):	4.8	ROM Ver:	n/a	Orig CD Speed	n/a																		
Dimensions (in):	1.5 H x 10.9 W x 8.5 D	ROM Size:	1MB	Int CD Support:																			
		AppleTalk Ver:	57.0.4																				
		Mac OS	7.1																				
		Supported:	7.5																				
			7.1.1 (Pro)																				
			7.5.1																				
			7.5.3																				
			7.5.5																				
			7.6																				
			7.6.1																				

Published Date: Jul 26, 2017

# Macintosh PowerBook Duo 280: Technical Specifications

## Macintosh PowerBook Duo 280

Logic Board	Ports	Power
Processor: 68LC040, 66	USB:	Max Watts: 25
PMMU: integrated	ADB:	Amps: 1.04
FPU: none	Video: none	BTU per Hr: 85.5
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: none	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: Duo, NiMH Type III
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: modem, dock	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer	
Memory	Video Memory	
Logic Board: 4 MB	<div> <div>Resolution</div> <div>Video Memory built-in LCD screen (built in)</div> </div>	
RAM Slots: 1, Duo	512 x 384 n/a-bit	
Min - Max RAM: 4 MB - 40 MB	640 x 400 4-bit	
Min RAM Speed: 70	640 x 480 n/a-bit	
RAM Sizes: 4-36 MB	800 x 600 n/a-bit	
Install in Groups of: 1	832 x 624 n/a-bit	
	1024 x 768 n/a-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
Physical	Software	Storage
Introduced: 5/16/1994	Addressing Modes: 24-, 32-bit	Floppy Size: none
Discontinued: 11/14/1994	Orig SSW: 7.1.1	Floppy Inject: n/a
Form Factor: PowerBook Duo	Orig Enabler: PowerBook Duo Enabler v2.0	Min. Int HD Size: 240MB
Gestalt ID: 102	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 4.2	ROM Ver: n/a	Orig CD Speed: n/a
Dimensions (in): 1.4 H x 10.9 W x 8.5 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1.1	
	7.5	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	
	8.1	

# Macintosh PowerBook Duo 280c: Technical Specifications

## Macintosh PowerBook Duo 280c

Logic Board		Ports		Power	
Processor:	68LC040, 66	USB:		Max Watts:	36
PMMU:	integrated	ADB:		Amps:	1.5
FPU:	none	Video:	none	BTU per Hr:	123.12
Data Path:	32, 33	Floppy:	none	Voltage:	100-240
L1 Cache:	8K	SCSI:	none	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	Duo, NiMH Type III
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	modem, dock	FireWire:			
		Mic Type:	none		
		AirPort Ready:			
		Other Ports:	Printer		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory built-in LCD screen (built in)		
RAM Slots:	1, Duo				
Min - Max RAM:	4 MB - 40 M B	512 x 384	n/a-bit		
Min RAM Speed:	70	640 x 400	16-bit		
RAM Sizes:	4-36 MB	640 x 480	8-bit		
Install in Groups of:	1	800 x 600	n/a-bit		
		832 x 624	n/a-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	5/16/1994	Addressing Modes: 24-, 32-bit		Floppy Size:	none
Discontinued:	1/27/1996	Orig SSW:	7.1.1	Floppy Inject:	n/a
Form Factor:	PowerBook Duo	Orig Enabler:	PowerBook Duo Enabler v2.0	Min. Int HD Size:	320MB
Gestalt ID:	103	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	4.8	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	1.5 H x 10.9 W x 8.5 D	ROM Size:	1MB	Int CD Support:	
		AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1.1		
			7.5		
			7.5.1		
			7.5.3		
			7.5.5		
			7.6		
			7.6.1		
			8.0		
			8.1		

Published Date: Jul 26, 2017

# iPod classic - Technical Specifications

This article has been archived and is no longer updated by Apple.

	80GB	160GB
Storage/capacity	(20,000 songs)	(40,000 songs)
Color	Silver, Black	Silver, Black
Battery life	Up to 30 hours of music playback; up to 5 hours of video playback	Up to 40 hours of music playback; up to 7 hours of video playback
Display	2.5-inch (diagonal) color LCD with LED backlight	
Ports	Dock connector, stereo minijack	
Connectivity	USB through dock connector; component and composite video through dock connector (with AV cables or kit, sold separately); audio through headphone jack	
Charge time	About 4 hours (2-hour fast charge to 80% capacity)	
Audio support	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF	
Photo support	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats	
Video support	H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats	
Size	4.1 x 2.4 x 0.41 inches (103.5 x 61.8 x 10.5 mm)	4.1 x 2.4 x 0.53 inches (103.5 x 61.8 x 13.5 mm)
Weight	4.9 ounces (140 grams)	5.7 ounces (162 grams)
Included accessories	Earphones, USB cable, dock adapter	

## Size and weight

- 80GB model
  - Height: 4.1 inches (103.5 mm)
  - Width: 2.4 inches (61.8 mm)
  - Depth: 0.41 inch (10.5 mm)
  - Weight: 4.9 ounces (140 grams)
- 160GB model
  - Height: 4.1 inches (103.5 mm)
  - Width: 2.4 inches (61.8 mm)
  - Depth: 0.53 inch (13.5 mm)
  - Weight: 5.7 ounces (162 grams)

## In the box

- iPod classic
- Earphones

# 15\_iPod classic - Technical Specifications.pdf

- USB 2.0 cable
- Dock adapter
- Quick Start guide

## Capacity

- 80GB or 160GB hard drive<sup>1</sup>
- Holds up to 20,000 or 40,000 songs in 128-Kbps AAC format<sup>2</sup>
- Holds up to 25,000 iPod-viewable photos<sup>3</sup>
- Holds up to 100 hours or up to 200 hours of video<sup>4</sup>
- Stores data via USB hard drive

## Display

- 2.5-inch (diagonal) color LCD with LED backlight
- 320-by-240-pixel resolution at 163 pixels per inch
- Support for display of multiple languages and characters simultaneously

## Audio

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF
- User-configurable maximum volume limit

## Video

- H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

## Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.8 or later
- iTunes 7.4 or later<sup>5</sup>

## Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 2 or later
- iTunes 7.4 or later<sup>5</sup>

## Languages

- Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, and Turkish
- Additional language support for display of song, album, and artist information: Bulgarian, Croatian, Romanian, Serbian, Slovak, Slovenian, and Ukrainian

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Input and output

- Dock connector
- 3.5-mm stereo headphone jack

## Power and battery<sup>6</sup>

- Built-in rechargeable lithium ion battery
- Playback time (80GB model)
  - Music playback time: Up to 30 hours when fully charged
  - Video playback time: Up to 5 hours when fully charged

## 80GB iPod

- Playback time (160GB model)
  - Music playback time: Up to 40 hours when fully charged
  - Video playback time: Up to 7 hours when fully charged

## 160GB iPod

- Charging via USB to computer system or power adapter (sold separately)
  - Fast-charge time: about 2 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 4 hours

## Limited warranty and service

Your iPod comes with single-incident telephone support for the first 90 days and a one-year limited warranty. Purchase the AppleCare Protection Plan for iPod to extend your service and support to two full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.

## Options & Accessories

Available from the Apple Online Store or an Apple Authorized Reseller.

### Accessories

#### iPod Hi-Fi

#### iPod Radio Remote

#### Dock

Apple Universal Dock with Remote

#### Headphones

In-Ear Headphones

#### Services

AppleCare Protection Plan

#### Cables and adapters

- Apple Component AV Cable
- Apple Composite AV Cable
- Apple USB Power Adapter
- Apple iPod Dock Connector to USB 2.0 Cable
- World Travel Adapter Kit

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Music capacity is based on 4 minutes per song and 128-Kbps AAC encoding; actual capacity varies by content.
  3. Photo capacity is based on iPod-viewable photos transferred from iTunes.
  4. Video capacity based on H.264 1.5-Mbps video at 640-by-480 resolution combined with 128-Kbps audio; actual capacity varies by content.
  5. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.
  6. Testing conducted by Apple in August 2007 using preproduction hardware and software. The playlist contained 358 unique audio tracks

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consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (128-Kbps AAC). Video content was purchased from the iTunes Store. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

Published Date: Apr 6, 2016



# Macintosh PowerBook 520: Technical Specifications

## Macintosh PowerBook 520

Logic Board	Ports	Power
Processor: 68LC040, 50	USB:	Max Watts: 40
PMMU: integrated	ADB: 1	Amps: 1.015
FPU: none	Video: mini-15	BTU per Hr: 136.8
Data Path: 32, 25	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB500, NiMH
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: modem	FireWire:	
	Mic Type: Line in	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory built-in LCD screen (built in) 512K VRAM (ext. only) (built in)
RAM Slots: 1, PB5xx	512 x 384	n/a-bit 8-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 70	640 x 480	4-bit 8-bit
RAM Sizes: 4, 8, 12, 20, 32 MB	800 x 600	n/a-bit 8-bit
Install in Groups of: 1	832 x 624	n/a-bit 8-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 5/16/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 6/10/1995	Orig SSW: 7.1.1	Floppy Inject: manual
Form Factor: PowerBook 520	Orig Enabler: PowerBook 500 Series Enabler	Min. Int HD Size: 160-240MB
Gestalt ID: 72	ROM ID: n/a	Int HD Interface: SCSI
Weight (lbs): 6.3	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.3 H x 11.5 W x 9.7 D	ROM Size: 2MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1.1 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1	

# Macintosh PowerBook 520c: Technical Specifications

## Macintosh PowerBook 520c

Logic Board	Ports	Power
Processor: 68LC040, 50	USB:	Max Watts: 40
PMMU: integrated	ADB: 1	Amps: 1.015
FPU: none	Video: mini-15	BTU per Hr: 136.8
Data Path: 32, 25	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB500, NiMH
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: modem	FireWire:	
	Mic Type: Line in	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory built-in LCD screen (built in) 512K VRAM (ext. only) (built in)
RAM Slots: 1, PB5xx	512 x 384	n/a-bit 8-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 70	640 x 480	8-bit 8-bit
RAM Sizes: 4, 8, 12, 20, 32 MB	800 x 600	n/a-bit 8-bit
Install in Groups of: 1	832 x 624	n/a-bit 8-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 5/16/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 9/16/1995	Orig SSW: 7.1.1	Floppy Inject: manual
Form Factor: PowerBook 520	Orig Enabler: PowerBook 500 Series Enabler	Min. Int HD Size: 160-320MB
Gestalt ID: 72	ROM ID: n/a	Int HD Interface: SCSI
Weight (lbs): 6.4	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.3 H x 11.5 W x 9.7 D	ROM Size: 2MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1.1 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1	

# Macintosh PowerBook 540: Technical Specifications

## Macintosh PowerBook 540

Logic Board	Ports	Power
Processor: 68LC040, 66	USB:	Max Watts: 40
PMMU: integrated	ADB: 1	Amps: 1.015
FPU: none	Video: mini-15	BTU per Hr: 136.8
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB500, NiMH
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: modem	FireWire:	
	Mic Type: Line in	
	AirPort Ready:	
	Other Ports: Printer Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory built-in LCD screen (built in)      Video Memory 512K VRAM (ext. only) (built in)
RAM Slots: 1, PB5xx	512 x 384	n/a-bit      8-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit      n/a-bit
Min RAM Speed: 70	640 x 480	8-bit      8-bit
RAM Sizes: 4, 8, 12, 20, 32 MB	800 x 600	n/a-bit      8-bit
Install in Groups of: 1	832 x 624	n/a-bit      8-bit
	1024 x 768	n/a-bit      n/a-bit
	1152 x 870	n/a-bit      n/a-bit
	1280 x 1024	n/a-bit      n/a-bit
	Notes: At 8-bit setting, the 540's LCD screen will display up to 64 grays.	
Physical	Software	Storage
Introduced: 5/16/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 10/17/1994	Orig SSW: 7.1.1	Floppy Inject: manual
Form Factor: PowerBook 520	Orig Enabler: PowerBook 500 Series Enabler	Min. Int HD Size: 240MB
Gestalt ID: 72	ROM ID: n/a	Int HD Interface: SCSI
Weight (lbs): 7.1	ROM Ver: n/a	Orig CD Speed: n/a
Dimensions (in): 2.3 H x 11.5 W x 9.7 D	ROM Size: 2MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1.1 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1	

# Macintosh PowerBook 540c: Technical Specifications

## Macintosh PowerBook 540c

Logic Board	Ports	Power
Processor: 68LC040, 66	USB:	Max Watts: 40
PMMU: integrated	ADB: 1	Amps: 1.015
FPU: none	Video: mini-15	BTU per Hr: 136.8
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB500, NiMH
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: modem	FireWire:	
	Mic Type: Line in	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory built-in LCD screen (built in) Video Memory 512K VRAM (ext. only) (built in)
RAM Slots: 1, PB5xx	512 x 384	n/a-bit 8-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	16-bit n/a-bit
Min RAM Speed: 70	640 x 480	8-bit 8-bit
RAM Sizes: 4, 8, 12, 20, 32 MB	800 x 600	n/a-bit 8-bit
Install in Groups of: 1	832 x 624	n/a-bit 8-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 5/16/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 8/26/1995	Orig SSW: 7.1.1	Floppy Inject: manual
Form Factor: PowerBook 520	Orig Enabler: PowerBook 500 Series Enabler	Min. Int HD Size: 240-500MB
Gestalt ID: 72	ROM ID: n/a	Int HD Interface: SCSI
Weight (lbs): 7.3	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.3 H x 11.5 W x 9.7 D	ROM Size: 2MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1.1 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1	

# Macintosh PowerBook 550c: Technical Specifications

## Macintosh PowerBook 550c

Logic Board		Ports		Power	
Processor:	68040, 66	USB:		Max Watts:	40
PMMU:	integrated	ADB:	1	Amps:	1.015
FPU:	none	Video:	mini-15	BTU per Hr:	136.8
Data Path:	32, 33	Floppy:	none	Voltage:	100-240
L1 Cache:	8K	SCSI:	HDI-30	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	PB500, NiMH
2nd Processor:	none	Ethernet:	AAUI-15	Soft Power:	yes
Slots:	modem	FireWire:			
		Mic Type:	Line in		
		AirPort Ready:			
		Other Ports:	Printer Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory built-in LCD screen (built in)	Video Memory 512K VRAM (ext. only) (built in)	
RAM Slots:	1, PB5xx	512 x 384	n/a-bit	8-bit	
Min - Max RAM:	12 MB - 36 MB	640 x 400	16-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	8-bit	8-bit	
RAM Sizes:	4, 8, 12, 20, 32 MB	800 x 600	n/a-bit	8-bit	
Install in Groups of:	1	832 x 624	n/a-bit	8-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	5/30/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	J-7.5	Floppy Inject:	manual
Form Factor:	PowerBook 520	Orig Enabler:	PowerBook 550c Enabler	Min. Int HD Size:	750MB
Gestalt ID:	72	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	6.8	ROM Ver:	\$30	Orig CD Speed	n/a
Dimensions (in):	2.3 H x 11.5 W x 9.7 D	ROM Size:	2MB	Int CD Support:	
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	58.1.3		
		Mac OS Supported:	7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0		

# Macintosh PowerBook 500 with PowerPC: Technical Specifications

## Macintosh PowerBook 500 with PowerPC

Logic Board	Ports	Power
Processor: 603e, 100	USB:	Max Watts: 40
PMMU: integrated	ADB: 1	Amps: 1.015
FPU: integrated	Video: mini-15	BTU per Hr: 136.8
Data Path: 64, 33	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB500, NiMH
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: modem	FireWire:	
Notes: This configuration includes a Macintosh PowerBook Processor Card Upgrade.	Mic Type: Line in	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory built-in LCD screen (built in) Video Memory 512K VRAM (ext. only) (built in)
RAM Slots: 1, PB5xx	512 x 384	n/a-bit 8-bit
Min - Max RAM: 8 MB - 40 MB	640 x 400	16-bit n/a-bit
Min RAM Speed: 70	640 x 480	8-bit 8-bit
RAM Sizes: 4, 8, 12, 20, 32 MB	800 x 600	n/a-bit 8-bit
Install in Groups of: 1	832 x 624	n/a-bit 8-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 8/26/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.2	Floppy Inject: manual
Form Factor: PowerBook 520	Orig Enabler: PowerBook 5300/2300/190 Enabler	Min. Int HD Size: 160-500MB
Gestalt ID: 126	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 7.3	ROM Ver: \$2A	Orig CD Speed n/a
Dimensions (in): 2.3 H x 11.5 W x 9.7 D	ROM Size: 4MB	Int CD Support:
Notes: The weight of this configuration may vary.	AppleTalk Ver: 58.1.6	
	Mac OS Supported: 7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0	

# Macintosh PowerBook 1400cs/117: Technical Specifications

## Macintosh PowerBook 1400cs/117

Logic Board		Ports		Power	
Processor:	603e, 117	USB:		Max Watts:	45
PMMU:	integrated	ADB:	1	Amps:	1.875
FPU:	integrated	Video:	opt. mini-15	BTU per Hr:	153.9
Data Path:	64, 33.3	Floppy:	none	Voltage:	100-220
L1 Cache:	32K	SCSI:	HDI-30	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	PB1400, NiMH
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	2 Type II PC Card (1 Type III)	FireWire:			
		Mic Type:	Line in		
		AirPort Ready:			
		Other Ports:	Printer Speaker ,		
Memory		Video Memory			
Logic Board:	12, 16 M B	Resolution	Video Memory built-in LCD screen (built in)		
RAM Slots:	1, PB1400	512 x 384	n/a-bit		
Min - Max RAM:	12 MB - 64 MB	640 x 400	n/a-bit		
Min RAM Speed:	70	640 x 480	n/a-bit		
RAM Sizes:	8-24 MB	800 x 600	16-bit		
Install in Groups of:	1	832 x 624	n/a-bit		
Notes:	Memory expansion slot allows "piggy-backing" of up to two memory cards.	1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	10/1/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	7/14/1997	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PowerBook 1400	Orig Enabler:	PowerBook 1400 Enabler	Min. Int HD Size:	750MB, 1GB
Gestalt ID:	310	ROM ID:	\$077D	Int HD Interface:	ATA
Weight (lbs):	6.7	ROM Ver:	\$32	Orig CD Speed	6x, 8x
Dimensions (in):	2 H x 11.5 W x 9 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	Weight of this system varies based on the accessories installed.	AppleTalk Ver:	58.1.6		
		Mac OS Supported:	7.5.3 7.6 7.6.1 8.0 8.1 8.5 8.6 9		

# Macintosh PowerBook 1400c/117: Technical Specifications

## Macintosh PowerBook 1400c/117

Logic Board	Ports	Power
Processor: 603e, 117	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.875
FPU: integrated	Video: opt. mini-15	BTU per Hr: 153.9
Data Path: 64, 33.3	Floppy: none	Voltage: 100-220
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB1400, NiMH
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: Line in	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 16MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, PB1400	512 x 384	n/a-bit
Min - Max RAM: 32 MB - 64 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	n/a-bit
RAM Sizes: 8-24 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	n/a-bit
Notes: Memory expansion slot allows "piggy-backing" of up to two memory cards.	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 10/1/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 7/14/1997	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PowerBook 1400	Orig Enabler: PowerBook 1400 Enabler	Min. Int HD Size: 1GB
Gestalt ID: 310	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 6.6	ROM Ver: \$32	Orig CD Speed: 6x
Dimensions (in): 2 H x 11.5 W x 9 D	ROM Size: 4MB	Int CD Support: yes
Notes: Weight of this system varies based on the accessories installed.	AppleTalk Ver: 58.1.6	
	Mac OS Supported: 7.5.3 7.6 7.6.1 8.0 8.1 8.5 8.6 9	



# Macintosh PowerBook 1400cs/133: Technical Specifications

## Macintosh PowerBook 1400cs/133

Logic Board	Ports	Power
Processor: 603e, 133	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.875
FPU: integrated	Video: opt. mini-15	BTU per Hr: 153.9
Data Path: 64, 33.3	Floppy: none	Voltage: 100-220
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: 128K	Geoports:	Battery Type: PB1400, NiMH
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: Line In	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 16 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, PB1400	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 64 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	n/a-bit
RAM Sizes: 8-24 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	n/a-bit
Notes: Memory expansion slot allows "piggy-backing" of up to two memory cards.	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 5/19/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.6.1	Floppy Inject: manual
Form Factor: PowerBook 1400	Orig Enabler: none	Min. Int HD Size: 1.3GB
Gestalt ID: 310	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 6.7	ROM Ver: n/a	Orig CD Speed 8x
Dimensions (in): 2 H x 11.5 W x 9 D	ROM Size: 4MB	Int CD Support: yes
Notes: Weight of this system varies based on the accessories installed.	AppleTalk Ver: n/a	
	Mac OS Supported: 7.6.1 8.0 8.1 8.5 8.6 9	

# Macintosh PowerBook 1400c/133: Technical Specifications

## Macintosh PowerBook 1400c/133

Logic Board		Ports		Power	
Processor:	603e, 133	USB:		Max Watts:	45
PMMU:	integrated	ADB:	1	Amps:	1.875
FPU:	integrated	Video:	opt. mini-15	BTU per Hr:	153.9
Data Path:	64, 33.3	Floppy:	none	Voltage:	100-220
L1 Cache:	32K	SCSI:	HDI-30	Freq Range:	50-60 Hz
L2 Cache:	128K	Geoports:		Battery Type:	PB1400, NiMH
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	2 Type II PC Card (1 Type III)	FireWire:			
		Mic Type:	Line in		
		AirPort Ready:			
		Other Ports:	Printer Speaker		
Memory		Video Memory			
Logic Board:	16 MB	Resolution	Video Memory built-in LCD screen (built in)		
RAM Slots:	1, PB1400	512 x 384	n/a-bit		
Min - Max RAM:	16 MB - 64 MB	640 x 400	n/a-bit		
Min RAM Speed:	70	640 x 480	n/a-bit		
RAM Sizes:	8-24 MB	800 x 600	16-bit		
Install in Groups of:	1	832 x 624	n/a-bit		
Notes:	Memory expansion slot allows "piggy-backing" of up to two memory cards.	1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	10/1/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PowerBook 1400	Orig Enabler:	PowerBook 1400 Enabler	Min. Int HD Size:	1, 1.3GB
Gestalt ID:	310	ROM ID:	\$077D	Int HD Interface:	ATA
Weight (lbs):	6.6	ROM Ver:	n/a	Orig CD Speed	6x, 8x
Dimensions (in):	2 H x 11.5 W x 9 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	Weight of this system varies based on the accessories installed.	AppleTalk Ver:	n/a		
		Mac OS Supported:	7.5.3 7.6 7.6.1 8.0 8.6 8.5 8.1 9		

# iMac (Mid 2007) - Technical Specifications

This article has been archived and is no longer updated by Apple.

	20-inch iMac (MA876LL)	20-inch iMac (MA877LL)	24-inch iMac (MA878LL)
Processor	2.0GHz Intel Core 2 Duo		2.4GHz Intel Core 2 Duo
L2 cache	4MB shared		
Frontside bus	800MHz		
Memory	1GB (one SO-DIMM) 667MHz DDR2 SDRAM (PC2-5300), supports up to 4GB		
Hard drive	250GB Serial ATA <sup>1</sup> ; 7200 rpm	320GB Serial ATA <sup>1</sup> ; 7200 rpm	
Optical drive	Slot-loading 8x SuperDrive with 4x double-layer burning (DVD±R DL/DVD±RW/CD-RW)		
Display	20-inch (viewable) glossy widescreen TFT active-matrix LCD, 1680 by 1050 pixels, millions of colors		24-inch (viewable) glossy widescreen TFT active-matrix LCD, 1920 by 1200 pixels, millions of colors
Video	Built-in iSight; mini-DVI output port with support for DVI, VGA, S-video, and composite video connections via adapter <sup>3</sup>		
Graphics	ATI Radeon HD 2400 XT with 128MB of GDDR3 memory	ATI Radeon HD 2600 PRO with 256MB of GDDR3 memory	
FireWire	One FireWire 400 and one FireWire 800 port; 7 watts each		
USB	Three USB 2.0 ports on computer; two USB 2.0 ports on keyboard		
Audio	Built-in stereo speakers with 24-watt digital amplifier, built-in microphone, optical digital audio output/headphone out, optical digital audio input/audio line in		
Ethernet	Built-in 10/100/1000BASE-T (Gigabit)		
Wireless	Built-in AirPort Extreme (802.11n) <sup>2</sup> ; built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module		
Hardware accessories	Apple Remote, Apple Keyboard, and Mighty Mouse		
Other	Built-in IR receiver		Built-in IR receiver, optional VESA mount adapter kit
Configure-to-order options	<ul style="list-style-type: none"><li>• 2GB Memory Upgrade (two 1GB)</li><li>• 4GB Memory Upgrade (two 2GB)</li><li>• 320GB or 500GB Hard Drive</li><li>• Apple Wireless Keyboard</li><li>• Wireless Mighty Mouse</li><li>• Apple USB Modem</li><li>• Software: iWork '08, Aperture, Logic Express, Final Cut Express</li></ul>	<ul style="list-style-type: none"><li>• 2GB Memory Upgrade (two 1GB)</li><li>• 4GB Memory Upgrade (two 2GB)</li><li>• 500GB or 750GB Hard Drive</li><li>• Apple Wireless Keyboard</li><li>• Wireless Mighty Mouse</li><li>• Apple USB Modem</li><li>• Software: iWork '08, Aperture, Logic Express, Final Cut Express</li></ul>	<ul style="list-style-type: none"><li>• 2.8GHz Intel Core 2 Extreme</li><li>• 2GB Memory Upgrade (two 1GB)</li><li>• 4GB Memory Upgrade (two 2GB)</li><li>• 500GB, 750GB, or 1TB Hard Drive</li><li>• Apple Wireless Keyboard</li><li>• Wireless Mighty Mouse</li><li>• Apple USB Modem</li><li>• Software: iWork '08, Aperture, Logic Express, Final Cut Express</li></ul>
Limited warranty and service	Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase theAppleCare Protection Plan to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.		
Apple and the global environment	Learn more about Apple’s dedication to reducing the environmental impact of our products and process.The Apple Product Environmental Specification details the environmental attributes of our products.		
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.		

In the box

- iMac
- Apple Keyboard
- Mighty Mouse
- Apple Remote
- Cleaning cloth
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

Processor and memory

- 2.0GHz or 2.4GHz Intel Core 2 Duo processor, or 2.8GHz Intel Core 2 Extreme processor
- 4MB shared L2 cache at full processor speed
- 800MHz system bus
- 1GB (one SO-DIMM) ofPC2-5300 (667MHz) DDR2 memory
- Two SO-DIMM slots support up to 4GB

Hard drive

- 20-inch model with 2.0GHz processor

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- 250GB Serial ATA 7200-rpm hard drive<sup>1</sup>
- Optional 320GB or 500GB Serial ATA 7200-rpm hard drive
- 20-inch model with 2.4GHz processor
  - 320GB Serial ATA 7200-rpm hard drive<sup>1</sup>
  - Optional 500GB or 750GB Serial ATA 7200-rpm hard drive
- 24-inch model with 2.4GHz processor
  - 320GB Serial ATA 7200-rpm hard drive<sup>1</sup>
  - Optional 500GB, 750GB, or 1TB Serial ATA 7200-rpm hard drive

## Optical drive

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
  - Writes DVD+R DL and DVD-R DL discs at up to 4x speed
  - Writes DVD-R and DVD+R discs at up to 8x speed
  - Writes DVD-RW at up to 6x speed and DVD+RW discs at up to 8x speed
  - Reads DVDs at up to 8x speed
  - Writes CD-R discs at up to 24x speed
  - Writes CD-RW discs at up to 16x speed
  - Reads CDs at up to 24x speed

## Display

- Built-in 20-inch (viewable) or 24-inch (viewable) glossy widescreen TFT active-matrix liquid crystal display
- Resolution
  - 20-inch: 1680 by 1050 pixels
  - 24-inch: 1920 by 1200 pixels
- Millions of colors at all resolutions
- Typical viewing angle
  - 20-inch models
    - 160° horizontal
    - 160° vertical
  - 24-inch model
    - 178° horizontal
    - 178° vertical
- Typical brightness: 290 nits (20-inch models); 380 nits (24-inch model)
- Typical contrast ratio: 800:1 (20-inch models); 750:1 (24-inch model)

## Communications

- Built-in AirPort Extreme wireless networking (802.11n)<sup>2</sup>
- Built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Works with 56K V.92 Apple USB Modem (sold separately)

## Graphics and video

- 20-inch model with 2.0GHz processor
  - ATI Radeon HD 2400 XT graphics processor
  - 128MB of GDDR3 memory
- 20-inch model with 2.4GHz processor and 24-inch model
  - ATI Radeon HD 2600 PRO graphics processor
  - 256MB of GDDR3 memory
- Mini-DVI output port with support for DVI, VGA, S-video, and composite video connections via adapter<sup>3</sup>
- Built-in iSight camera
- Support for external display in extended desktop mode
  - Digital resolutions up to 1920 by 1200
  - Analog resolutions up to 2048 by 1536
- Support for external display in video mirroring mode

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 200W (20-inch models); 280W (24-inch model)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Size and weight (20-inch)

- Height: 18.5 inches (46.9 cm)
- Width: 19.1 inches (48.5 cm)
- Depth: 7.4 inches (18.9 cm)
- Weight: 20 pounds (9.1 kg)<sup>4</sup>

## Size and weight (24-inch)

- Height: 20.5 inches (52.0 cm)
- Width: 22.4 inches (56.9 cm)

# 16\_iMac (Mid 2007) - Technical Specifications.pdf

- Depth: 8.1 inches (20.7 cm)
- Weight: 25.4 pounds (11.5 kg)<sup>4</sup>

## Peripheral connections

- One FireWire 400 and one FireWire 800 port; 7 watts each
- Total of five USB 2.0 ports: three ports on computer, two ports on keyboard

## Audio

- Built-in stereo speakers
- Internal 24-watt digital amplifier
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone

## Software

- Mac OS X v10.4.10 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand)
- iWork '08 (30-day trial)
- Front Row
- Photo Booth

## Options

### Accessories

- AirPort Express Base Station (M9470LL/A)
- AirPort Extreme Base Station (MB053LL/A)
- Apple Wireless Keyboard (MB167LL/A)
- Apple wireless Mighty Mouse (MB111LL/A)
- Apple 8x DVD-R Media Kit (M9472G/A)
- Apple Mini-DVI to DVI Adapter (M9321G/A)
- Apple Mini-DVI to VGA Adapter (M9320G/A)
- Apple Mini-DVI to Video Adapter (M9319G/A)
- Apple FireWire Cable (M8706G/A)
- AppleCare Protection Plan (MA520LL/A)
- iMac 24-inch VESA Mount Adapter (MB060G/A)

### Applications

- iWork (MA790Z/A)
- Aperture (MA438Z/A)
- Logic Express (MA338Z/A)
- Final Cut Express (MA261Z/A)
- .Mac Subscription (MA927Z/A)

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Based on an IEEE 802.11n draft specification. Also compatible with IEEE 802.11a, IEEE 802.11b, and IEEE 802.11g. Wireless Internet access requires a wireless access point and Internet access (fees may apply).
3. Adapters sold separately.
4. Weight varies by configuration and manufacturing process.

Intel and Intel Core are trademarks of Intel Corp. in the U.S. and other countries. Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

Published Date: Apr 6, 2016

# Macintosh PowerBook 1400c/166: Technical Specifications

## Macintosh PowerBook 1400c/166

Logic Board		Ports		Power	
Processor:	603e, 166	USB:		Max Watts:	45
PMMU:	integrated	ADB:	1	Amps:	1.875
FPU:	integrated	Video:	opt. mini-15	BTU per Hr:	153.9
Data Path:	64, 33.3	Floppy:	none	Voltage:	100-220
L1 Cache:	32K	SCSI:	HDI-30	Freq Range:	50-60 Hz
L2 Cache:	128K	Geoports:		Battery Type:	PB1400, NiMH
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	2 Type II PC Card (1 Type III)	FireWire:			
		Mic Type:	Line In		
		AirPort Ready:			
		Other Ports:	Printer Speaker ,		
Memory		Video Memory			
Logic Board:	16 MB	Resolution	Video Memory built-in LCD screen (built in)		
RAM Slots:	1, PB1400	512 x 384	n/a-bit		
Min - Max RAM:	16 MB - 64 MB	640 x 400	n/a-bit		
Min RAM Speed:	70	640 x 480	n/a-bit		
RAM Sizes:	8-24MB	800 x 600	16-bit		
Install in Groups of:	1	832 x 624	n/a-bit		
Notes:	Memory expansion slot allows "piggy-backing" of up to two memory cards.	1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	7/14/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.6.1	Floppy Inject:	manual
Form Factor:	PowerBook 1400	Orig Enabler:	none	Min. Int HD Size:	2GB
Gestalt ID:	310	ROM ID:	\$077D	Int HD Interface:	ATA
Weight (lbs):	6.6	ROM Ver:	n/a	Orig CD Speed	8x
Dimensions (in):	2 H x 11.5 W x 9 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	Weight of this system varies based on the accessories installed.	AppleTalk Ver:	n/a		
		Mac OS Supported:	7.6.1 8.0 8.1 8.5 8.6 9		

# Macintosh PowerBook 1400cs/166: Technical Specifications

## Macintosh PowerBook 1400cs/166

Logic Board		Ports		Power	
Processor:	603e, 166	USB:		Max Watts:	45
PMMU:	integrated	ADB:	1	Amps:	1.875
FPU:	integrated	Video:	opt.mini-15	BTU per Hr:	153.9
Data Path:	64, 33.3	Floppy:	none	Voltage:	100-220
L1 Cache:	32K	SCSI:	HDI-30	Freq Range:	50-60 Hz
L2 Cache:	128K	Geoports:		Battery Type:	PB1400, NiMH
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	2 Type II PC Card (1 Type III )	FireWire:			
		Mic Type:	Line In		
		AirPort Ready:			
		Other Ports:	Printer Speaker		
Memory		Video Memory			
Logic Board:	16 MB	Resolution Video Memory built-in LCD screen (built in)			
RAM Slots:	1, PB1400	512 x 384	n/a-bit		
Min - Max RAM:	16 MB - 64 MB	640 x 400	n/a-bit		
Min RAM Speed:	70	640 x 480	n/a-bit		
RAM Sizes:	8-24 MB	800 x 600	16-bit		
Install in Groups of:	1	832 x 624	n/a-bit		
Notes:	Memory expansion slot allows "piggy backing" of up to two memory cards.	1024 x 768	na/-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	10/15/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	8.0	Floppy Inject:	manual
Form Factor:	PowerBook 1400	Orig Enabler:	none	Min. Int HD Size:	1.3GB
Gestalt ID:	310	ROM ID:	\$077D	Int HD Interface:	ATA
Weight (lbs):	6.6	ROM Ver:	n/a	Orig CD Speed	12x
Dimensions (in):	6 H x 11.5 W x 9 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	Weight of this machine varies depending on accessories installed	AppleTalk Ver:	n/a		
		Mac OS Supported:	8.0 8.1 8.5 8.6 9		

Published Date: Jul 26, 2017

# Macintosh PowerBook Duo 2300c/100: Technical Specifications

## Macintosh PowerBook Duo 2300c/100

Logic Board	Ports	Power
Processor: 603e, 100	USB:	Max Watts: 36
PMMU: integrated	ADB:	Amps: 1.5
FPU: integrated	Video: none	BTU per Hr: 123.12
Data Path: 64, 33	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: none	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: Duo, NiMH Type III
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: modem, dock	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, Duo	512 x 384	n/a-bit
Min - Max RAM: 8 MB - 56 MB	640 x 400	16-bit
Min RAM Speed: 70	640 x 480	8-bit
RAM Sizes: 4-48 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 8/28/1995	Addressing Modes: 32-bit	Floppy Size: none
Discontinued: n/a	Orig SSW: 7.5.2	Floppy Inject: n/a
Form Factor: PowerBook Duo	Orig Enabler: PowerBook 5300/2300/190 Enabler	Min. Int HD Size: 750MB-1.1GB
Gestalt ID: 118	ROM ID: \$077D	Int HD Interface: SCSI & IDE
Weight (lbs): 4.8	ROM Ver: \$2A	Orig CD Speed n/a
Dimensions (in): 1.5 H x 10.9 W x 8.5 D	ROM Size: 4MB	Int CD Support:
	AppleTalk Ver: 58.1.6	
	Mac OS 7.5.2	
	Supported: 7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	
	8.1	
	8.5	
	8.6	
	9	



# Macintosh PowerBook 2400c/180: Technical Specifications

## Macintosh PowerBook 2400c/180

Logic Board	Ports	Power
Processor: 603e, 180	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.875
FPU: integrated	Video: HDI-15	BTU per Hr: 153.9
Data Path: 64, 40	Floppy: n/a	Voltage: 100-220
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports:	Battery 29 Wh Lithium
2nd Processor: none	Ethernet: none	Type: Ion
Slots: 2 Type II PC Card (1 Type III)	FireWire:	Soft Power: yes
	Mic Type: n/a	
	AirPort Ready:	
	Other Ports: Printer Speaker ,	
	Port Notes: Infrared port supports AppleTalk and 1-Mb IrDA.	
Memory	Video Memory	
Logic Board: 16 MB	Resolution	Video Memory built-in LCD screen (built-in)
RAM Slots: 1, SO DIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 48 MB	640 x 400	n/a-bit
Min RAM Speed:	640 x 480	n/a-bit
RAM Sizes: n/a	800 x 600	16-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 5/8/1997	Addressing Modes: 32-bit	Floppy Size: none
Discontinued: n/a	Orig SSW: 7.6.1	Floppy Inject: manual
Form Factor: PowerBook 2400	Orig Enabler: none	Min. Int HD Size: 1.3GB
Gestalt ID: 307	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 4.4	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 1.9 H x 10.5 W x 10.5 D	ROM Size: 4MB	Int CD Support:
	AppleTalk Ver: n/a	
	Mac OS 7.6.1	
	Supported: 8.0	
	8.1	
	8.5	
	8.6	
	9	

# Macintosh PowerBook 3400c/180: Technical Specifications

## Macintosh PowerBook 3400c/180

Logic Board	Ports	Power
Processor: 603e, 180	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.875
FPU: integrated	Video: HDI-15	BTU per Hr: 153.9
Data Path: 64, 40	Floppy: none	Voltage: 100-220
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 1	Battery Type: 32 Wh Lithium Ion
2nd Processor: none	Ethernet: opt. 10baseT	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Speaker ,	
	Port Notes: Infrared port supports AppleTalk and 1-Mb IrDA.	
Memory	Video Memory	
Logic Board: 16 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, PB 3400	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 144 MB	640 x 400	n/a-bit
Min RAM Speed: 60	640 x 480	n/a-bit
RAM Sizes: 4-128 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	n/a-bit
Notes: This system supports EDO RAM devices on its memory modules.	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 2/17/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.6	Floppy Inject: manual
Form Factor: PowerBook 3400	Orig Enabler: PowerBook 3400 Enabler	Min. Int HD Size: 1.3GB
Gestalt ID: 306	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 7.2	ROM Ver: \$36	Orig CD Speed: 6x
Dimensions (in): 2.4 H x 11.5 W x 9.5 D	ROM Size: 4MB	Int CD Support: yes
Notes: Weight of this system varies based on the accessories installed.	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.6 7.6.1 8.0 8.1 8.5 8.6 9	

# Macintosh PowerBook 3400c/200: Technical Specifications

## Macintosh PowerBook 3400c/200

Logic Board	Ports	Power
Processor: 603e, 200	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.875
FPU: integrated	Video: HDI-15	BTU per Hr: 153.9
Data Path: 64, 40	Floppy: none	Voltage: 100-220
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 1	Battery Type: 32 Wh Lithium Ion
2nd Processor: none	Ethernet: 10baseT	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Speaker ,	
	Port Notes: Infrared port supports AppleTalk and 1-Mb IrDA.	
Memory	Video Memory	
Logic Board: 16 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, PB 3400	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 144 MB	640 x 400	n/a-bit
Min RAM Speed: 60	640 x 480	n/a-bit
RAM Sizes: 4-128 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	n/a-bit
Notes: This system supports EDO RAM devices on its memory modules.	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 2/17/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.6	Floppy Inject: manual
Form Factor: PowerBook 3400	Orig Enabler: PowerBook 3400 Enabler	Min. Int HD Size: 2GB
Gestalt ID: 306	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 7.2	ROM Ver: \$36	Orig CD Speed: 6x
Dimensions (in): 2.4 H x 11.5 W x 9.5 D	ROM Size: 4MB	Int CD Support: yes
Notes: Weight of this system varies based on the accessories installed.	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.6 7.6.1 8.0 8.1 8.5 8.6 9	

# Macintosh PowerBook 3400c/240: Technical Specifications

## Macintosh PowerBook 3400c/240

Logic Board	Ports	Power
Processor: 603e, 240	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.875
FPU: integrated	Video: HDI-15	BTU per Hr: 153.9
Data Path: 64, 40	Floppy: none	Voltage: 100-220
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 1	Battery Type: 32 Wh Lithium Ion
2nd Processor: none	Ethernet: 10baseT	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Speaker ,	
	Port Notes: Infrared port supports AppleTalk and 1-Mb IrDA.	
Memory	Video Memory	
Logic Board: 16 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, PB 3400	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 144 MB	640 x 400	n/a-bit
Min RAM Speed: 60	640 x 480	n/a-bit
RAM Sizes: 4-128 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	n/a-bit
Notes: This system supports EDO RAM devices on its memory modules.	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 2/17/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.6	Floppy Inject: manual
Form Factor: PowerBook 3400	Orig Enabler: PowerBook 3400 Enabler	Min. Int HD Size: 3GB
Gestalt ID: 306	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 7.2	ROM Ver: \$36	Orig CD Speed: 12x
Dimensions (in): 2.4 H x 11.5 W x 9.5 D	ROM Size: 4MB	Int CD Support: yes
Notes: Weight of this system varies based on the accessories installed.	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.6 7.6.1 8.0 8.1 8.5 8.6 9	

# Macintosh PowerBook 5300/100: Technical Specifications

## Macintosh PowerBook 5300/100

Logic Board	Ports	Power
Processor: 603e, 100	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.88
FPU: integrated	Video: mini-15	BTU per Hr: 153.9
Data Path: 64, 33.3	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB5300, NiMH
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: Line in	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, PB53xx	512 x 384	n/a-bit
Min - Max RAM: 8 MB - 64 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	4-bit
RAM Sizes: 8-56 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 8/25/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.2	Floppy Inject: manual
Form Factor: PowerBook 5300	Orig Enabler: PowerBook 5300 Enabler	Min. Int HD Size: 500MB
Gestalt ID: 128	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 5.9	ROM Ver: \$27	Orig CD Speed n/a
Dimensions (in): 2 H x 11.5 W x 8.5 D	ROM Size: 4MB	Int CD Support:
	AppleTalk Ver: 58.1.6	
	Mac OS Supported: 7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 9 8.5 8.6	

# Macintosh PowerBook 5300cs/100: Technical Specifications

## Macintosh PowerBook 5300cs/100

Logic Board	Ports	Power
Processor: 603e, 100	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.88
FPU: integrated	Video: mini-15	BTU per Hr: 153.9
Data Path: 64, 33.3	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB5300, NiMH
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: Line in	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 8, 16 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, PB53xx	512 x 384	n/a-bit
Min - Max RAM: 8 MB - 64 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	8-bit
RAM Sizes: 8-64 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 8/25/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 8/3/1996	Orig SSW: 7.5.2	Floppy Inject: manual
Form Factor: PowerBook 5300	Orig Enabler: PowerBook 5300 Enabler	Min. Int HD Size: 500-750MB
Gestalt ID: 128	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 6.2	ROM Ver: \$27	Orig CD Speed n/a
Dimensions (in): 2.2 H x 11.5 W x 8.5 D	ROM Size: 4MB	Int CD Support:
	AppleTalk Ver: 58.1.6	
	Mac OS Supported: 7.5.2	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	
	8.5	
	8.6	
	9	

# Macintosh PowerBook 5300c/100: Technical Specifications

## Macintosh PowerBook 5300c/100

Logic Board	Ports	Power
Processor: 603e, 100	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.88
FPU: integrated	Video: mini-15	BTU per Hr: 153.9
Data Path: 64, 33.3	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB5300, NiMH
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: Line in	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 8, 16 MB	Resolution	Video Memory built-in LCD (512K VRAM) built-in LCD (1MB VRAM) (built in) ( )
RAM Slots: 1, PB53xx	512 x 384	n/a-bit n/a-bit
Min - Max RAM: 8 MB - 64 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 70	640 x 480	8-bit 16-bit
RAM Sizes: 8-64 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit n/a-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 8/25/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.2	Floppy Inject: manual
Form Factor: PowerBook 5300	Orig Enabler: PowerBook 5300 Enabler	Min. Int HD Size: 500-750MB
Gestalt ID: 128	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 6.2	ROM Ver: \$27	Orig CD Speed n/a
Dimensions (in): 2.2 H x 11.5 W x 8.5 D	ROM Size: 4MB	Int CD Support:
	AppleTalk Ver: 58.1.6	
	Mac OS Supported: 7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.6 9	

# MacBook Pro (Mid 2007, 2.4/2.2GHz) - Technical Specifications

This article has been archived and is no longer updated by Apple.

	15.4-inch: 2.2GHz(MA895LL)	15.4-inch: 2.4GHz(MA896LL)	17-inch: 2.4GHz(MA897LL/A)
<b>Display</b>	15.4-inch (diagonal), 1440 by 900 resolution, TFT widescreen		17-inch (diagonal), 1680 by 1050 resolution, TFT widescreen
<b>Processor</b>	2.2GHz Intel Core 2 Duo		2.4GHz Intel Core 2 Duo
<b>Memory</b>	2GB (two SO-DIMMs) 667MHz DDR2 SDRAM (PC2-5300)		
<b>PCI Express graphics</b>	NVIDIA GeForce 8600M GT with 128MB of GDDR3 SDRAM and dual-link DVI		NVIDIA GeForce 8600M GT with 256MB of GDDR3 SDRAM and dual-link DVI
<b>Hard disk drive</b> <sup>1</sup>	120GB Serial ATA; 5400 rpm		160GB Serial ATA; 5400 rpm
<b>Slot-loading optical drive</b>	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)		
<b>Expansion</b>	One FireWire 400, one FireWire 800, two USB 2.0 ports, and ExpressCard/34 slot		One FireWire 400, one FireWire 800, three USB 2.0 ports, and ExpressCard/34 slot
<b>Video</b>	Built-in iSight camera, DVI, VGA (DVI to VGA adapter included)		
<b>Audio</b>	Combined optical digital input/audio line in, combined optical digital output/headphone out, stereo speakers, microphone		
<b>Ethernet</b>	Built-in 10/100/1000BASE-T (Gigabit)		
<b>Wireless</b> <sup>2</sup>	Built-in AirPort Extreme (802.11n); built-in Bluetooth 2.0+EDR		
<b>Modem</b>	Apple USB Modem (sold separately)		
<b>Input</b>	Apple Remote; full-size, illuminated keyboard with ambient light sensor; scrolling trackpad		
<b>Weight</b>	5.4 pounds		6.8 pounds
<b>Footprint</b>	14.1 by 9.6 inches		15.4 by 10.4 inches
<b>Thickness</b>	1.0 inch		
<b>Video accessories</b>	DVI to VGA adapter included (other adapters sold separately)		
<b>Hardware accessories</b>	85W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery		
<b>Limited warranty and service</b>	Your MacBook Pro comes with 90 days of telephone support and a one-year limited warranty. For more information, visit Apple support or call 800-823-2775.		

## In the box

- MacBook Pro
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Lithium-polymer battery
- Apple Remote
- DVI to VGA adapter
- Install/restore DVDs
- Printed and electronic documentation

## Processor and memory

- 15-inch MacBook Pro
  - 2.2GHz or 2.4GHz Intel Core 2 Duo processor, 4MB on-chip shared L2 cache running 1:1 with processor speed
- 17-inch MacBook Pro
  - 2.4GHz Intel Core 2 Duo processor, 4MB on-chip shared L2 cache running 1:1 with processor speed
- 2GB (two SO-DIMMs) of PC2-5300 (667MHz) DDR2 memory; two SO-DIMM slots support up to 4GB
- 800MHz frontside bus

## Expansion

- One FireWire 400 port at up to 400 Mbps
- One FireWire 800 port at up to 800 Mbps
- 15-inch MacBook Pro
  - Two 480-Mbps USB 2.0 ports
- 17-inch MacBook Pro



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- Three 480-Mbps USB 2.0 ports
- ExpressCard/34 slot

## Security

- Kensington cable lock slot

## Battery and power

- 15-inch MacBook Pro
  - 60-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 6 hours of battery life<sup>3</sup>
- 17-inch MacBook Pro
  - 68-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 5.75 hours of battery life<sup>3</sup>
- 85W MagSafe Power Adapter with cable management system
- MagSafe power adapter port

## Communications

- Built-in AirPort Extreme wireless networking (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g Wi-Fi Certified<sup>2</sup>
- Built-in Bluetooth 2.0+EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Combined optical digital input/audio line in (minijack)
- Combined optical digital output/headphone out (minijack)
- Built-in stereo speakers
- Internal omnidirectional microphone (located under left speaker grille)

## Display

- 15-inch MacBook Pro
  - 15.4-inch (diagonal) TFT LED backlit display with support for millions of colors; optional glossy widescreen display
  - Supported resolutions: 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio; 720 by 480 at 3:2 aspect ratio stretched
- 17-inch MacBook Pro
  - 17-inch (diagonal) TFT display with support for millions of colors; optional glossy widescreen display
  - Supported resolutions: 1680 by 1050 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1280 by 1024 at 5:4 aspect ratio; 1280 by 1024 at 5:4 aspect ratio stretched; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio; 720 by 480 at 3:2 aspect ratio stretched
  - Optional 17-inch (diagonal) TFT widescreen display with support for millions of colors; optional glossy widescreen display. Supported resolutions: 1920 by 1200 (native), 1680 by 1050, 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1280 by 1024 at 5:4 aspect ratio; 1280 by 1024 at 5:4 aspect ratio stretched; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio; 720 by 480 at 3:2 aspect ratio stretched

## Video and graphics support

- 15-inch MacBook Pro
  - NVIDIA GeForce 8600M GT graphics processor with dual-link DVI support, 128MB of GDDR3 SDRAM on 2.2GHz configuration; 256MB of GDDR3 SDRAM on 2.4GHz configuration
- 17-inch MacBook Pro
  - NVIDIA GeForce 8600M GT graphics processor with dual-link DVI support and 256MB of GDDR3 SDRAM.
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- DVI output port
- VGA output using included DVI to VGA adapter
- Built-in iSight camera

## Storage

- 15-inch MacBook Pro

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- 120GB or 160GB 5400-rpm Serial ATA hard drive; optional 160GB 7200-rpm or 200GB 4200-rpm drive<sup>1</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
  - Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
  - Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD
- 17-inch MacBook Pro
  - 160GB 5400-rpm Serial ATA hard drive; optional 160GB 7200-rpm or 250GB 4200-rpm drive<sup>1</sup>
  - 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
    - Maximum write: 8x DVD-R, DVD+R, DVD+RW; 6x DVD-RW; 4x DVD-R DL (double layer), DVD+R DL (double layer); 24x CD-R; 16x CD-RW
    - Maximum read: 8x DVD-R, DVD+R, DVD+RW, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW; 24x CD

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded numeric keypad
  - Backlit keyboard with ambient light sensors for automatic adjustment of keyboard illumination and screen brightness
- Solid-state scrolling trackpad for precise cursor control; supports two-finger scrolling, tap, double-tap, and drag capabilities
- Apple Remote

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- DC input: 18.5 Vdc, 4.6A maximum
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and weight

- 15-inch MacBook Pro
  - Height: 1.0 inch (2.59 cm)
  - Width: 14.1 inches (35.7 cm)
  - Depth: 9.6 inches (24.3 cm)
  - Weight: 5.4 pounds (2.45 kg) with battery and optical drive installed<sup>4</sup>
- 17-inch MacBook Pro
  - Height: 1.0 inch (2.59 cm)
  - Width: 15.4 inches (39.2 cm)
  - Depth: 10.4 inches (26.5 cm)
  - Weight: 6.8 pounds (3.08 kg) with battery and optical drive installed<sup>4</sup>

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork '08 (30-day trial), Aperture Trial
- Photo Booth
- Front Row

## Options

- Apple Wireless Keyboard
- Apple USB Modem
- Apple Wireless Mighty Mouse
- Apple Keyboard
- AppleCare Protection Plan

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## Online store options

- Up to 4GB main memory
- 160GB 7200-rpm, 160GB 5400-rpm, 200GB 4200-rpm hard drive (15-inch only); 250GB 4200-rpm hard drive (17-inch only) <sup>1</sup>
- AirPort Extreme Base Station
- AirPort Express
- Apple DVI to Video Adapter
- Apple 85W MagSafe Power Adapter
- MagSafe Airline Adapter
- Rechargeable Battery, 15-inch MacBook Pro
- Rechargeable Battery, 17-inch MacBook Pro
- World Travel Adapter Kit
- iWork '08

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# Macintosh PowerBook 5300ce/117: Technical Specifications

## Macintosh PowerBook 5300ce/117

Logic Board	Ports	Power
Processor: 603e, 117	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.88
FPU: integrated	Video: mini-15	BTU per Hr: 153.9
Data Path: 64, 33.3	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: HDI-30	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: PB5300, NiMH
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 2 Type II PC Card (1 Type III)	FireWire:	
	Mic Type: Line in	
	AirPort Ready:	
	Other Ports: Printer Speaker	
Memory	Video Memory	
Logic Board: 16 MB	Resolution	Video Memory built-in LCD screen (built in)
RAM Slots: 1, PB53xx	512 x 384	n/a-bit
Min - Max RAM: 32 MB - 64 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	n/a-bit
RAM Sizes: 8-64 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 8/25/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.2	Floppy Inject: manual
Form Factor: PowerBook 5300	Orig Enabler: PowerBook 5300 Enabler	Min. Int HD Size: 1.1GB
Gestalt ID: 128	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 6.2	ROM Ver: \$27	Orig CD Speed n/a
Dimensions (in): 2.2 H x 11.5 W x 8.5 D	ROM Size: 4MB	Int CD Support:
	AppleTalk Ver: 58.1.6	
	Mac OS Supported: 7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.6 9	

# Macintosh Duo MiniDock: Technical Specifications

## Macintosh Duo MiniDock

Logic Board		Ports	Power
Processor:	none,	USB:	Max Watts:
PMMU:	n/a	ADB:	1
FPU:	none	Video:	DB-15
Data Path:	,	Floppy:	none
L1 Cache:	n/a	SCSI:	HDI-30
L2 Cache:	none	Geoports:	
2nd Processor:	n/a	Ethernet:	none
Slots:	none	FireWire:	
		Mic Type:	Omni
		AirPort Ready:	
		Other Ports:	Printer Modem Speaker ,
Memory		Video Memory	
Logic Board:	none	Resolution	Video Memory 512K VRAM (built in)
RAM Slots:	0, n/a	512 x 384	8-bit
Min - Max RAM:	n/a - n/a	640 x 400	n/a-bit
Min RAM Speed:		640 x 480	8-bit
RAM Sizes:	n/a	800 x 600	n/a-bit
Install in Groups of:	n/a	832 x 624	8-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
Physical		Software	Storage
Introduced:	10/19/1992	Addressing Modes:	n/a
Discontinued:	8/5/1995	Orig SSW:	n/a
Form Factor:	n/a	Orig Enabler:	n/a
Gestalt ID:		ROM ID:	n/a
Weight (lbs):	1.2	ROM Ver:	n/a
Dimensions (in):	2.1 H x 10.6 W x 3.2 D	ROM Size:	n/a
		AppleTalk Ver:	n/a
		Mac OS Supported:	
			Floppy Size: none
			Floppy Inject: n/a
			Min. Int HD Size: none
			Int HD Interface: none
			Orig CD Speed n/a
			Int CD Support:

# Macintosh Duo Dock: Technical Specifications

## Macintosh Duo Dock

Logic Board		Ports		Power	
Processor:	none,	USB:		Max Watts:	87
PMMU:	n/a	ADB: 1		Amps:	4.2
FPU:	opt. 68882	Video: DB-15		BTU per Hr:	297.54
Data Path:	,	Floppy: none		Voltage:	100-240
L1 Cache:	n/a	SCSI: HDI-30		Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	none
2nd Processor:	n/a	Ethernet: none		Soft Power:	yes
Slots:	2 NuBus	FireWire:		Pass Through:	yes
		Mic Type: Omni			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 512K VRAM (built in)	Video Memory 1MB VRAM (1x512K)	
RAM Slots:	0, n/a	512 x 384	8-bit	16-bit	
Min - Max RAM:	n/a - n/a	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:		640 x 480	8-bit	16-bit	
RAM Sizes:	n/a	800 x 600	8-bit	16-bit	
Install in Groups of:	n/a	832 x 624	8-bit	16-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	10/19/1992	Addressing Modes: n/a		Floppy Size:	1.44MB
Discontinued:	7/15/1995	Orig SSW: n/a		Floppy Inject:	auto
Form Factor:	Duo Dock	Orig Enabler: n/a		Min. Int HD Size:	opt. 230MB
Gestalt ID:		ROM ID: n/a		Int HD Interface:	SCSI
Weight (lbs):	13.1	ROM Ver: n/a		Orig CD Speed	n/a
Dimensions (in):	4.8 H x 12.3 W x 16.3 D	ROM Size: n/a		Int CD Support:	
		AppleTalk Ver: n/a			
		Mac OS Supported:			

# PowerBook Duo Dock II: Technical Specifications

## PowerBook Duo Dock II

Logic Board		Ports	Power	
Processor:	none,	USB:	Max Watts:	87
PMMU:	n/a	ADB:	Amps:	4.2
FPU:	68882	Video:	BTU per Hr:	297.54
Data Path:	,	Floppy:	Voltage:	100-240
L1 Cache:	n/a	SCSI:	Freq Range:	50-60 Hz
L2 Cache:	32K	Geoports:	Battery Type:	none
2nd Processor:	n/a	Ethernet:	Soft Power:	yes
Slots:	2 NuBus	FireWire:	Pass Through:	yes
		Mic Type:	Omni	
		AirPort Ready:		
		Other Ports:	Printer Modem Speaker ,	
Memory		Video Memory		
Logic Board:	none	Resolution	Video Memory 1MB VRAM (built in)	
RAM Slots:	0, n/a	512 x 384	16-bit	
Min - Max RAM:	n/a - n/a	640 x 400	n/a-bit	
Min RAM Speed:		640 x 480	16-bit	
RAM Sizes:	n/a	800 x 600	16-bit	
Install in Groups of:	n/a	832 x 624	16-bit	
		1024 x 768	8-bit	
		1152 x 870	8-bit	
		1280 x 1024	n/a-bit	
Physical		Software		Storage
Introduced:	5/16/1994	Addressing Modes:		Floppy Size:
Discontinued:	5/25/1995	Orig SSW:		Floppy Inject:
Form Factor:	Duo Dock	Orig Enabler:		Min. Int HD Size:
Gestalt ID:		ROM ID:		Int HD Interface:
Weight (lbs):	13.5	ROM Ver:		Orig CD Speed
Dimensions (in):	5.1 H x 12.3 W x 16.3 D	ROM Size:		Int CD Support:
		AppleTalk Ver:		
		Mac OS Supported:		

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# PowerBook Duo Dock Plus: Technical Specifications

## PowerBook Duo Dock Plus

Logic Board		Ports	Power	
Processor:	none,	USB:	Max Watts:	87
PMMU:	n/a	ADB:	Amps:	4.2
FPU:	none	Video:	BTU per Hr:	297.54
Data Path:	,	Floppy:	Voltage:	100-240
L1 Cache:	n/a	SCSI:	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:	Battery Type:	none
2nd Processor:	n/a	Ethernet:	Soft Power:	yes
Slots:	2 NuBus	FireWire:	Pass Through:	yes
		Mic Type:	Omni	
		AirPort Ready:		
		Other Ports:	Printer Modem Speaker ,	
Memory		Video Memory		
Logic Board:	none	Resolution	Video Memory 1MB VRAM (built in)	
RAM Slots:	0, n/a	512 x 384	16-bit	
Min - Max RAM:	n/a - n/a	640 x 400	n/a-bit	
Min RAM Speed:		640 x 480	16-bit	
RAM Sizes:	n/a	800 x 600	16-bit	
Install in Groups of:	n/a	832 x 624	16-bit	
		1024 x 768	8-bit	
		1152 x 870	8-bit	
		1280 x 1024	n/a-bit	
Physical		Software		Storage
Introduced:	5/15/1995	Addressing Modes:		Floppy Size:
Discontinued:	n/a	Orig SSW:		Floppy Inject:
Form Factor:	Duo Dock	Orig Enabler:		Min. Int HD Size:
Gestalt ID:		ROM ID:		Int HD Interface:
Weight (lbs):	13.5	ROM Ver:		Orig CD Speed
Dimensions (in):	5.1 H x 12.3 W x 16.3 D	ROM Size:		Int CD Support:
		AppleTalk Ver:		
		Mac OS Supported:		

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# Macintosh 128K: Technical Specifications

## Macintosh 128K

Logic Board		Ports		Power	
Processor:	68000, 8	USB:		Max Watts:	60
PMMU:	none	ADB:		Amps:	.5
FPU:	none	Video:	none	BTU per Hr:	205.2
Data Path:	16, 8	Floppy:	DB-19	Voltage:	105-125
L1 Cache:	none	SCSI:	none	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	4.5V alkaline, #523
2nd Processor:	none	Ethernet: none			
Slots:	none	FireWire:			
		Mic Type:	none		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
		Port Notes:	The serial ports in this system do not support handshaking or synchronous modems.		
Memory		Video Memory			
Logic Board:	0.125 MB	Resolution	Video Memory built-in CRT (built in)		
RAM Slots:	0, n/a	512 x 384	1-bit		
Min - Max RAM:	0.125MB - 0.125 MB	640 x 400	n/a-bit		
Min RAM Speed:		640 x 480	n/a-bit		
RAM Sizes:	n/a	800 x 600	n/a-bit		
Install in Groups of:	n/a	832 x 624	n/a-bit		
Notes:	This system has no built-in memory expansion, however third-party upgrades could take this system to 512K.				
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
		Notes: Screen size is 512x342.			
Physical		Software		Storage	

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Introduced:	1/24/1984	Addressing Modes:	24-bit	Floppy Size:	400K
Discontinued:	10/1/1985	Orig SSW:	0.0	Floppy Inject:	manual
Form Factor:	128	Orig Enabler:	none	Min. Int HD Size:	none
Gestalt ID:	1	ROM ID:	\$0000	Int HD Interface:	none
Weight (lbs):	16.5	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	13.6 H x 9.6 W x 10.9 D	ROM Size:	64K	Int CD Support:	
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	n/a		
		Mac OS Supported:	<1.0 1.0 1.1 2.0 2.0.1 5.0 5.1 6.0 6.0.1 6.0.2 6.0.3 6.0.4 6.0.5 6.0.7 6.0.8 7.0.1P		

# Macintosh 512K: Technical Specifications

## Macintosh 512K

Logic Board		Ports		Power	
Processor:	68000, 8	USB:		Max Watts:	60
PMMU:	none	ADB:		Amps:	.5
FPU:	none	Video:	none	BTU per Hr:	205.2
Data Path:	16, 8	Floppy:	DB-19	Voltage:	105-125
L1 Cache:	none	SCSI:	none	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	4.5V alkaline, #523
2nd Processor:	none	Ethernet: none			
Slots:	none	FireWire:			
		Mic Type:	none		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
		Port Notes:	The serial ports in this system do not support handshaking or synchronous modems.		
Memory		Video Memory			
Logic Board:	0.5 MB	Resolution	Video Memory built-in CRT (built in)		
RAM Slots:	0, n/a	512 x 384	1-bit		
Min - Max RAM:	0.5 MB - 0.5 MB	640 x 400	n/a-bit		
Min RAM Speed:		640 x 480	n/a-bit		
RAM Sizes:	n/a	800 x 600	n/a-bit		
Install in Groups of:	n/a	832 x 624	n/a-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
		Notes: Screen size is 512x342.			
Physical		Software		Storage	

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Introduced:	9/10/1984	Addressing Modes:	24-bit	Floppy Size:	400K
Discontinued:	4/14/1986	Orig SSW:	0.7	Floppy Inject:	manual
Form Factor:	128	Orig Enabler:	none	Min. Int HD Size:	none
Gestalt ID:	1	ROM ID:	\$0000	Int HD Interface:	none
Weight (lbs):	16.5	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	13.6 H x 9.6 W x 10.9 D	ROM Size:	64K	Int CD Support:	
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	n/a		
		Mac OS Supported:	<1.0 1.0 1.1 2.0 2.0.1 5.0 5.1 6.0 6.0.1 6.0.2 6.0.3 6.0.4 6.0.5 6.0.7 6.0.8		

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# Macintosh 512Ke: Technical Specifications

## Macintosh 512Ke

Logic Board	Ports	Power
Processor: 68000, 8 PMMU: none FPU: none Data Path: 16, 8 L1 Cache: none L2 Cache: none 2nd Processor: none Slots: none	USB: ADB: Video: none Floppy: DB-19 SCSI: none Geoports: Ethernet: none FireWire: Mic Type: none AirPort Ready: Other Ports: Printer, Modem, Speaker Port Notes: The serial ports in this system do not support handshaking or synchronous modems.	Max Watts: 60 Amps: .5 BTU per Hr: 205.2 Voltage: 105-125 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline, #523
Memory	Video Memory	
Logic Board: 0.5 MB RAM Slots: 0, n/a Min - Max RAM: 0.5 MB - 0.5 MB Min RAM Speed: RAM Sizes: n/a Install in Groups of: n/a	ResolutionVideo Memory built-in CRT (built in) 512 x 3841-bit 640 x 400n/a-bit 640 x 480n/a-bit 800 x 600n/a-bit 832 x 624n/a-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit Notes: Screen size is 512x342.	
Physical	Software	Storage

Introduced: 4/14/1986	Addressing Modes: 24-bit	Floppy Size: 800K
Discontinued: 9/1/1987	Orig SSW: 1.0	Floppy Inject: manual
Form Factor: 128	Orig Enabler: none	Min. Int HD Size: none
Gestalt ID: 3	ROM ID: \$0075	Int HD Interface: none
Weight (lbs): 16.5	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 13.6 H x 9.6 W x 10.9 D	ROM Size: 128K	Int CD Support:
Notes: Support Discontinued 9/1/98	AppleTalk Ver: n/a	
	Mac OS Supported: 1.1 2.0 2.0.1 5.0 5.1 6.0 6.0.1 6.0.2 6.0.3 6.0.5 6.0.4 6.0.7 6.0.8 1.0	

# Macintosh XL: Technical Specifications

## Macintosh XL

Logic Board	Ports	Power
Processor: 68000, 5	USB:	Max Watts: 150
PMMU: none	ADB:	Amps: 1.25
FPU: none	Video: RCA	BTU per Hr: 513
Data Path: 16, 5	Floppy: none	Voltage: 120
L1 Cache: none	SCSI: none	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: none
2nd Processor: none	Ethernet: none	
Slots: 3 Lisa slots	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer Modem	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory built-in CRT (built in)
RAM Slots: 2, Lisa cards	512 x 384	n/a-bit
Min - Max RAM: 0.5 MB - 2 MB	640 x 400	n/a-bit
Min RAM Speed:	640 x 480	1-bit
RAM Sizes: 512 K	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Screen size is 720x364, 608x431 with Screen Kit.	
Physical	Software	Storage
Introduced: 1/1/1985	Addressing Modes: 24-bit	Floppy Size: 400K
Discontinued: 8/1/1986	Orig SSW: MacWorks	Floppy Inject: manual
Form Factor: Lisa	Orig Enabler: none	Min. Int HD Size: none-10MB
Gestalt ID: 2	ROM ID: n/a	Int HD Interface: n/a
Weight (lbs): 48	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 15.2 H x 18.7 W x 13.8 D	ROM Size: 16K	Int CD Support:
	AppleTalk Ver: none	
	Mac OS Supported:	

# MacBook (Mid 2007) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## MacBook (Mid 2007) - Technical Specifications

	2.0GHz MacBook (MB061LL/A)	2.16GHz MacBook (MB062LL/A)	2.16GHz MacBook (MB063LL/A)
Color	White	White	Black
Processor	2.0GHz Intel Core 2 Duo	2.16GHz Intel Core 2 Duo	2.16GHz Intel Core 2 Duo
L2 cache	4MB shared	4MB shared	4MB shared
System bus	667MHz	667MHz	667MHz
Memory	1GB (two 512MB) of 667MHz DDR2 SDRAM (PC2-5300); supports up to 2GB		
Hard drive <sup>1</sup>	80GB Serial ATA; 5400 rpm	120GB Serial ATA; 5400 rpm	160GB Serial ATA; 5400 rpm
Slot-loading optical drive	Combo drive (DVD-ROM/CD-RW)	8x SuperDrive (DVD+R DL/DVD±RW/CD-RW)	
Graphics	Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory <sup>1</sup>		
Video	Built-in iSight camera; mini-DVI output port with support for DVI, VGA, S-video, and composite video (requires adapters, sold separately)		
Display	13.3-inch (diagonal) glossy TFT widescreen display, 1280 by 800 resolution		
FireWire	One FireWire 400 port (8 watts)		
USB	Two USB 2.0 ports (up to 480 Mbps)		
Audio	Built-in stereo speakers, built-in omnidirectional microphone, combined optical digital audio input/audio line in, combined optical digital audio output/headphone out		
Networking	Built-in 10/100/1000BASE-T (Gigabit) Ethernet		
Wireless	Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification) <sup>2</sup> ; built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module		
Hardware accessories	Apple Remote, 60W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery		
Limited warranty and service	Your MacBook comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.		

### Technical Specifications

- In the box
- MacBook
  - Apple Remote
  - 60W MagSafe Power Adapter, AC wall plug, and power cord
  - Lithium-polymer battery
  - Install/restore DVDs
  - Printed and electronic documentation

- Processor and memory
- 2.0GHz or 2.16GHz Intel Core 2 Duo processor
  - 4MB shared L2 cache running at full processor speed
  - 667MHz frontside bus
  - 1GB (two 512MB SO-DIMMs) of 667MHz DDR2 SDRAM (PC2-5300); two SO-DIMM slots support up to 2GB

- Storage
- 80GB, 120GB, or 160GB 5400-rpm Serial ATA hard disk drive; optional 120GB or 160GB 5400-rpm drive or 200GB 4200-rpm drive<sup>3</sup>
  - One of the following optical drives:
    - 24x slot-loading Combo drive (DVD-ROM/CD-RW)
      - Reads DVDs at up to 8x speed
      - Writes CD-R discs at up to 24x speed
      - Writes CD-RW discs at up to 16x speed
      - Reads CDs at up to 24x speed
    - 8x slot-loading SuperDrive (DVD+R DL/DVD±RW/CD-RW)
      - Writes DVD+R DL (double layer) discs at up to 4x speed
      - Writes DVD-R and DVD+R discs at up to 8x speed
      - Writes DVD-RW and DVD+RW discs at up to 4x speed
      - Reads DVDs at up to 8x speed
      - Writes CD-R discs at up to 24x speed
      - Writes CD-RW discs at up to 10x speed
      - Reads CDs at up to 24x speed



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## Battery and power

- 55-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 6 hours of battery life<sup>3</sup>
- 60W MagSafe Power Adapter with cable management system
- MagSafe power adapter port

## Display

- 13.3-inch (diagonal) glossy widescreen TFT display with support for millions of colors
- Supported resolutions: 1280 by 800 (native), 1152 by 720, 1024 by 768, 1024 by 640, 800 by 600, 800 by 500, 720 by 480, and 640 by 480 at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 at 3:2 aspect ratio

## Graphics and video support

- Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory<sup>3</sup>
- Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 1920 by 1200 pixels on an external display, both at millions of colors
- Built-in iSight camera
- Mini-DVI port
- DVI output using mini-DVI to DVI adapter (sold separately)
- VGA output using mini-DVI to VGA adapter (sold separately)
- Composite and S-video output using mini-DVI to video adapter (sold separately)

## Communications

- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification)<sup>4</sup>
- Built-in Bluetooth 2.0 + Enhanced Data Rate (EDR)
- Optional external Apple USB Modem

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)

## Peripheral connections

- One FireWire 400 port (up to 400 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and weight

- Height: 1.08 inches (2.75 cm)
- Width: 12.78 inches (32.5 cm)
- Depth: 8.92 inches (22.7 cm)
- Weight: 5.1 pounds (2.31 kg)

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork '08 (30-day trial)
- Front Row

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded numeric keypad
- Solid-state scrolling trackpad for precise cursor control; supports two-finger scrolling, tap, double-tap, and drag capabilities
- Apple Remote

## Security

- Kensington cable lock slot

## Options

### Configure to order

- 120GB (5400 rpm) hard drive
- 160GB (5400 rpm) hard drive
- 200GB (4200 rpm) hard drive
- Up to 2GB of 667MHz DDR2 SDRAM

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- Apple USB Modem (MA034Z/A)
- Apple Mini-DVI to DVI Adapter (M9321G/B)
- Apple Mini-DVI to VGA Adapter (M9320G/A)
- Aperture (MA715Z/A)
- Final Cut Express (MA261Z/A)
- Logic Express (MA603Z/A)
- iWork '08 (MA790Z/A)

## Accessories

- AirPort Extreme Base Station (MA073LL/A)
- AirPort Express Base Station (M9470LL/A)
- MagSafe Airline Adapter (MA598Z/A)
- Apple Mini-DVI to Video Adapter (M9319G/A)
- AppleCare Protection Plan (MA519LL/A)
- Apple Wireless Keyboard (M9270LL/A)
- Apple Wireless Mighty Mouse (MA272LL/A)

1. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 80MB, resulting in 944MB of system memory available on 1GB configurations.
2. Wireless Internet access requires a base station or other wireless access point and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.
3. 1GB = 1 billion bytes; actual formatted capacity less.
4. Battery life depends on configuration and use.

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# Macintosh Plus: Technical Specifications

## Macintosh Plus

Logic Board		Ports		Power	
Processor:	68000, 8	USB:		Max Watts:	60
PMMU:	none	ADB:		Amps:	.5
FPU:	none	Video:	none	BTU per Hr:	205.2
Data Path:	16, 8	Floppy:	DB-19	Voltage:	105-125
L1 Cache:	none	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	4.5V alkaline, #523
2nd Processor:	none	Ethernet:	none		
Slots:	none	FireWire:			
		Mic Type:	none		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory built-in CRT (built in)		
RAM Slots:	4, 30-pin SIMM	512 x 384	1-bit		
Min - Max RAM:	1 MB - 4 MB	640 x 400	n/a-bit		
Min RAM Speed:	150	640 x 480	n/a-bit		
RAM Sizes:	256 K, 1 MB	800 x 600	n/a-bit		
Install in Groups of:	2	832 x 624	n/a-bit		
Notes:	This system cannot use two-chip 1MB SIMMs.	1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
		Notes: Screen size is 512x342.			
Physical		Software		Storage	
Introduced:	1/16/1986	Addressing Modes:	24-bit	Floppy Size:	800K
Discontinued:	10/15/1990	Orig SSW:	1.1	Floppy Inject:	auto
Form Factor:	128	Orig Enabler:	none	Min. Int HD Size:	none
Gestalt ID:	4	ROM ID:	\$0075	Int HD Interface:	none
Weight (lbs):	16.5	ROM Ver:	\$6000	Orig CD Speed	n/a
Dimensions (in):	13.6 H x 9.6 W x 10.9 D	ROM Size:	128K	Int CD Support:	
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	19		
		Mac OS Supported:	1.1 2.0 2.0.1 5.0 5.1 6.0 6.0.1 6.0.2 6.0.3 6.0.5 6.0.4 6.0.7 6.0.8 7.0 7.0.1 7.1 7.5 7.5.1 7.5.3 7.5.5		

Logic Board		Ports		Power	
Processor:	68000, 8	USB:		Max Watts:	100
PMMU:	none	ADB:	2	Amps:	.83
FPU:	none	Video:	none	BTU per Hr:	342
Data Path:	16, 8	Floppy:	DB-19	Voltage:	90-270
L1 Cache:	none	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	n/a
2nd Processor:	none	Ethernet:	none		
Slots:	1 SE PDS	FireWire:			
		Mic Type:	none		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory built-in CRT (built in)		
RAM Slots:	4, 30-pin SIMM	512 x 384	1-bit		
Min - Max RAM:	1 MB - 4 MB	640 x 400	n/a-bit		
Min RAM Speed:	150	640 x 480	n/a-bit		
RAM Sizes:	256 K, 1 MB	800 x 600	n/a-bit		
Install in Groups of:	2	832 x 624	n/a-bit		
Notes:	This system cannot use two-chip 1MB SIMMs.	1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
		Notes: Screen size is 512x342.			
Physical		Software		Storage	
Introduced:	3/2/1987	Addressing Modes:	24-bit	Floppy Size:	800K
Discontinued:	8/1/1989	Orig SSW:	2.0	Floppy Inject:	auto
Form Factor:	SE	Orig Enabler:	none	Min. Int HD Size:	none-40MB
Gestalt ID:	5	ROM ID:	\$0276	Int HD Interface:	SCSI
Weight (lbs):	17	ROM Ver:	0	Orig CD Speed	n/a
Dimensions (in):	13.6 H x 9.69 W x 10.9 D	ROM Size:	256K	Int CD Support:	
Notes:	Some systems shipped with two 800K floppy disk drives. Support Discontinued 9/1/98	AppleTalk Ver:	48		
		Mac OS Supported:	2.0 2.0.1 5.0 5.1 6.0 6.0.1 6.0.2 6.0.3 6.0.4 6.0.5 6.0.7 6.0.8 7.0 7.0.1 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5		



# Macintosh SE FDHD: Technical Specifications

## Macintosh SE FDHD

Logic Board	Ports	Power
Processor: 68000, 8	USB:	Max Watts: 100
PMMU: none	ADB: 2	Amps: .83
FPU: none	Video: none	BTU per Hr: 342
Data Path: 16, 8	Floppy: DB-19	Voltage: 90-270
L1 Cache: none	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: n/a
2nd Processor: none	Ethernet: none	
Slots: 1 SE PDS	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory built-in CRT (built in)
RAM Slots: 4, 30-pin SIMM	512 x 384	1-bit
Min - Max RAM: 1 MB - 4 MB	640 x 400	n/a-bit
Min RAM Speed: 150	640 x 480	n/a-bit
RAM Sizes: 256 K, 1 MB	800 x 600	n/a-bit
Install in Groups of: 2	832 x 624	n/a-bit
Notes: This system cannot use two-chip 1MB SIMMs.	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Screen size is 512x342.	
Physical	Software	Storage
Introduced: 8/1/1989	Addressing Modes: 24-bit	Floppy Size: 1.44MB
Discontinued: 10/15/1990	Orig SSW: 6.0.3	Floppy Inject: auto
Form Factor: SE	Orig Enabler: none	Min. Int HD Size: 20-40MB
Gestalt ID: 5	ROM ID: \$037A	Int HD Interface: SCSI
Weight (lbs): 17	ROM Ver: 0	Orig CD Speed n/a
Dimensions (in): 13.6 H x 9.69 W x 10.9 D	ROM Size: 256K	Int CD Support:
Notes: Support Discontinued 9/1/98	AppleTalk Ver: 48	
	Mac OS Supported: 6.0.3 6.0.4 6.0.5 6.0.7 6.0.8 7.0 7.0.1 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5	

# Macintosh II: Technical Specifications

## Macintosh II

Logic Board		Ports		Power	
Processor:	68020, 16	USB:		Max Watts:	230
PMMU:	opt. 68851	ADB:	2	Amps:	1.9
FPU:	68881	Video:	none	BTU per Hr:	786.6
Data Path:	32, 16	Floppy:	none	Voltage:	90-270
L1 Cache:	0.25K	SCSI:	DB-25	Freq Range:	48-62 Hz
L2 Cache:	none	Geoports:		Battery Type:	n/a
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	6 NuBus	FireWire:		Pass Through:	yes
		Mic Type:	none		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory requires video card (n/a)		
RAM Slots:	8, 30-pin SIMM	512 x 384	n/a-bit		
Min - Max RAM:	1 MB - 20 MB	640 x 400	n/a-bit		
Min RAM Speed:	120	640 x 480	n/a-bit		
RAM Sizes:	256 K, 1, 4 MB	800 x 600	n/a-bit		
Install in Groups of:	4	832 x 624	n/a-bit		
Notes:	4MB or 16MB SIMMs cannot be put into Bank A, unless Macintosh II SuperDrive Upgrade is installed.	1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	

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Introduced:	3/2/1987	Addressing Modes:	24-bit	Floppy Size:	800K (x2)
Discontinued:	1/15/1990	Orig SSW:	2.0	Floppy Inject:	auto
Form Factor:	II	Orig Enabler:	none	Min. Int HD Size:	40-80MB
Gestalt ID:	6	ROM ID:	\$0178	Int HD Interface:	SCSI
Weight (lbs):	24	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	5.5 H x 18.7 W x 14.4 D	ROM Size:	256K	Int CD Support:	
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	49		
		Mac OS Supported:	2.0 2.0.1 5.0 5.1 6.0 6.0.1 6.0.2 6.0.3 6.0.4 6.0.5 6.0.7 6.0.8 7.0 7.0.1 7.1 7.1.1 (Pro) 7.5  7.5.1 7.5.3 7.5.5		



# Macintosh IIfx: Technical Specifications

## Macintosh IIfx

Logic Board		Ports	Power
Processor:	68030, 16	USB:	Max Watts: 230
PMMU:	integrated	ADB: 2	Amps: 1.9
FPU:	68882	Video: none	BTU per Hr: 786.6
Data Path:	32, 16	Floppy: none	Voltage: 90-270
L1 Cache:	0.5K	SCSI: DB-25	Freq Range: 48-62 Hz
L2 Cache:	none	Geoports:	Battery Type: 3.6V lithium
2nd Processor:	none	Ethernet: none	Soft Power: yes
Slots:	6 NuBus	FireWire:	Pass Through: yes
		Mic Type: none	
		AirPort Ready:	
		Other Ports: Printer Modem Speaker ,	
Memory		Video Memory	
Logic Board:	none	Resolution	Video Memory requires video card (n/a)
RAM Slots:	8, 30-pin SIMM	512 x 384	n/a-bit
Min - Max RAM:	1 MB - 32 MB	640 x 400	n/a-bit
Min RAM Speed:	120	640 x 480	n/a-bit
RAM Sizes:	256 K, 1, 4 MB	800 x 600	n/a-bit
Install in Groups of:	4	832 x 624	n/a-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
Physical		Software	Storage
Introduced:	9/19/1988	Addressing Modes: 24-bit	Floppy Size: 1.44MB (x2)
Discontinued:	10/15/1990	Orig SSW: 6.0.1	Floppy Inject: auto
Form Factor:	II	Orig Enabler: none	Min. Int HD Size: 40-80MB
Gestalt ID:	7	ROM ID: \$0178	Int HD Interface: SCSI
Weight (lbs):	24	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in):	5.5 H x 18.7 W x 14.4 D	ROM Size: 256K	Int CD Support:
Notes:	Support Discontinued 9/1/98	AppleTalk Ver: 49	
		Mac OS Supported: 6.0.1 6.0.2 6.0.3 6.0.4 6.0.5 6.0.7 6.0.8 7.0 7.0.1 7.1 7.1.1 (Pro) 7.5  7.5.1 7.5.3 7.5.5	

# Macintosh SE/30: Technical Specifications

## Macintosh SE/30

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	75
PMMU:	integrated	ADB:	2	Amps:	.63
FPU:	68882	Video:	none	BTU per Hr:	256.5
Data Path:	32, 16	Floppy:	DB-19	Voltage:	120-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	48-62 Hz
L2 Cache:	none	Geoports:		Battery Type: 3.6V lithium	
2nd Processor:	none	Ethernet:	none		
Slots:	1 SE/30 PDS	FireWire:			
		Mic Type:	none		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory built-in CRT (built in)		
RAM Slots:	8, 30-pin SIMM	512 x 384	1-bit		
Min - Max RAM:	1 MB - 32 MB	640 x 400	n/a-bit		
Min RAM Speed:	120	640 x 480	n/a-bit		
RAM Sizes:	256 K, 1, 4 MB	800 x 600	n/a-bit		
Install in Groups of:	4	832 x 624	n/a-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
		Notes: Screen size is 512x342.			
Physical		Software		Storage	
Introduced:	1/19/1989	Addressing Modes: 24-bit		Floppy Size:	1.44MB
Discontinued:	10/21/1990	Orig SSW: 6.0.3		Floppy Inject:	auto
Form Factor:	SE	Orig Enabler: none		Min. Int HD Size:	40-80MB
Gestalt ID:	9	ROM ID: \$0178		Int HD Interface:	SCSI
Weight (lbs):	19.5	ROM Ver: n/a		Orig CD Speed	n/a
Dimensions (in):	13.6 H x 9.6 W x 10.9 D	ROM Size: 256K		Int CD Support:	
Notes:	Support Discontinued 9/1/98	AppleTalk Ver: 49			
		Mac OS	6.0.5		
		Supported:	6.0.7		
			6.0.8		
			7.0		
			7.0.1		
			7.1		
			7.1.1 (Pro)		
			7.5		
			6.0.3		
			6.0.4		
			7.5.1		
			7.5.3		
			7.5.5		

# Macintosh IICx: Technical Specifications

## Macintosh IICx

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	159
PMMU:	integrated	ADB:	2	Amps:	1.3
FPU:	68882	Video:	none	BTU per Hr:	543.78
Data Path:	32, 16	Floppy:	DB-19	Voltage:	100-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	3 NuBus	FireWire:		Pass Through:	yes
		Mic Type:	none		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory requires video card (n/a)		
RAM Slots:	8, 30-pin SIMM	512 x 384	n/a-bit		
Min - Max RAM:	1 MB - 128 MB	640 x 400	n/a-bit		
Min RAM Speed:	120	640 x 480	n/a-bit		
RAM Sizes:	256 K, 1, 4, 16 MB	800 x 600	n/a-bit		
Install in Groups of:	4	832 x 624	n/a-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	3/7/1989	Addressing Modes:	24-bit	Floppy Size:	1.44MB
Discontinued:	3/11/1991	Orig SSW:	6.0.3	Floppy Inject:	auto
Form Factor:	IICx	Orig Enabler:	none	Min. Int HD Size:	40-80MB
Gestalt ID:	8	ROM ID:	\$0178	Int HD Interface:	SCSI
Weight (lbs):	13.6	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	5.5 H x 11.9 W x 14.4 D	ROM Size:	256K	Int CD Support:	
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	49		
		Mac OS Supported:	6.0.5 6.0.7 6.0.8 7.0 7.0.1 7.1 7.1.1 (Pro) 7.5 6.0.3 6.0.4 7.5.1 7.5.3 7.5.5		

# Macintosh IICI: Technical Specifications

## Macintosh IICI

Logic Board	Ports	Power
Processor: 68030, 25	USB:	Max Watts: 159
PMMU: integrated	ADB: 2	Amps: 1.3
FPU: 68882	Video: DB-15	BTU per Hr: 543.78
Data Path: 32, 25	Floppy: DB-19	Voltage: 100-240
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 32K	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 3 NuBus, 1 cache	FireWire:	Pass Through: yes
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 8, 30-pin SIMM	512 x 384	8-bit
Min - Max RAM: 1 MB - 128 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	8-bit
RAM Sizes: 256 K, 512 K, 1, 2, 4, 16 MB	800 x 600	n/a-bit
Install in Groups of: 4	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: 64K-320K of system DRAM are used for video.	
Physical	Software	Storage
Introduced: 9/20/1989	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 2/10/1993	Orig SSW: 6.0.4	Floppy Inject: auto
Form Factor: IICx	Orig Enabler: none	Min. Int HD Size: 40-80MB
Gestalt ID: 11	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 13.6	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 5.5 H x 11.9 W x 14.4 D	ROM Size: 512K	Int CD Support:
Notes: Support Discontinued 9/1/98	AppleTalk Ver: 52	
	Mac OS Supported: 6.0.5 6.0.7 6.0.8 7.0 7.0.1 7.1 7.1.1 (Pro) 7.5 6.0.4 7.5.1 7.5.3 7.5.5 7.6 7.6.1	

# Macintosh Classic: Technical Specifications

## Macintosh Classic

Logic Board		Ports		Power	
Processor:	68000, 8	USB:		Max Watts:	76
PMMU:	none	ADB:	1	Amps:	.63
FPU:	none	Video:	none	BTU per Hr:	259.92
Data Path:	16, 8	Floppy:	DB-19	Voltage:	120
L1 Cache:	none	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none		
Slots:	none	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	1 MB	Resolution	Video Memory built-in CRT (built in)		
RAM Slots:	2, 30-pin SIMM	512 x 384	1-bit		
Min - Max RAM:	1 MB - 4 MB	640 x 400	n/a-bit		
Min RAM Speed:	120	640 x 480	n/a-bit		
RAM Sizes:	256 K, 1 MB	800 x 600	n/a-bit		
Install in Groups of:	2	832 x 624	n/a-bit		
Notes:	RAM expansion beyond 1MB requires Macintosh Classic 1MB Memory Expansion Card, which has 1MB of additional RAM, and two SIMM connectors. This system cannot use two-chip 1MB SIMMs.				
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
		Notes: Screen size is 512x342.			
Physical		Software		Storage	
Introduced:	10/15/1990	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	9/14/1992	Orig SSW:	6.0.7	Floppy Inject:	auto
Form Factor:	Classic	Orig Enabler:	none	Min. Int HD Size:	none-40MB
Gestalt ID:	17	ROM ID:	\$0276	Int HD Interface:	SCSI
Weight (lbs):	16	ROM Ver:	n/a	Orig CD Speed:	n/a
Dimensions (in):	13.2 H x 9.7 W x 11.2 D	ROM Size:	512K	Int CD Support:	
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	48		
		Mac OS Supported:	6.0.7 6.0.8 7.0 7.0.1 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5		



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# Macintosh IIsi: Technical Specifications

## Macintosh IIsi

Logic Board		Ports	Power
Processor:	68030, 20	USB:	Max Watts: 160
PMMU:	integrated	ADB:	Amps: 1.33
FPU:	opt. 68882	Video:	BTU per Hr: 547.2
Data Path:	32, 20	Floppy:	Voltage: 100-240
L1 Cache:	0.5K	SCSI:	Freq Range: 50-60 Hz
L2 Cache:	none	Geoports:	Battery Type: 3.6V lithium
2nd Processor:	none	Ethernet:	Soft Power: yes
Slots:	1 NuBus or PDS	FireWire:	Pass Through: yes
		Mic Type:	
		AirPort Ready:	
		Other Ports:	
		Printer	
		Modem	
		Speaker	
		,	
Memory		Video Memory	
Logic Board:	1 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots:	4, 30-pin SIMM	512 x 384	8-bit
Min - Max RAM:	1 MB - 17 MB	640 x 400	n/a-bit
Min RAM Speed:	100	640 x 480	8-bit
RAM Sizes:	256 K, 512 K, 1, 2, 4 MB	800 x 600	n/a-bit
Install in Groups of:	4	832 x 624	n/a-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
		Notes: 64K-320K of system DRAM used for video.	
Physical		Software	Storage
Introduced:	10/15/1990	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued:	3/15/1993	Orig SSW:	Floppy Inject: auto
Form Factor:	IIsi	Orig Enabler:	Min. Int HD Size: 40-80MB
Gestalt ID:	18	ROM ID:	Int HD Interface: SCSI
Weight (lbs):	10	ROM Ver:	Orig CD Speed n/a
Dimensions (in):	4 H x 12.4 W x 14.9 D	ROM Size:	Int CD Support:
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	
		Mac OS	
		Supported:	
		6.0.7	
		6.0.8	
		7.0	
		7.0.1	
		7.1	
		7.1.1 (Pro)	
		7.5	
		7.5.1	
		7.5.3	
		7.5.5	
		7.6	
		7.6.1	

# Apple TV (1st generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Processor and storage

- Intel processor
- 40GB or 160GB hard drive<sup>2</sup> for storing content locally
- Up to 50 hours (40GB) or 200 hours (160GB) of video<sup>3</sup>
- Up to 9,000 songs (40GB) or 36,000 songs (160GB)<sup>4</sup>
- Up to 25,000 pictures<sup>5</sup>

## System requirements

- Mac or PC
- iTunes 7.6 or later
- Mac: Mac OS X v10.3.9 or v10.4.9 or later
- PC: Windows XP Home or Professional (SP2) or Windows Vista
- AirPort Extreme, Wi-Fi 802.11b, 802.11g, or 802.11n wireless network<sup>6</sup> (wireless video streaming requires 802.11g or 802.11n) or 10/100BASE-T Ethernet network

## Ports and interfaces

- HDMI (video and audio)<sup>7</sup>
- Component video
- Optical audio
- Analog RCA stereo audio
- 10/100BASE-T Ethernet
- USB 2.0
- 802.11n wireless networking<sup>6</sup>
- Built-in IR receiver (works with included Apple Remote)

## Environmental requirements

- Operating temperature: 32° to 104° F (0° to 40° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3,000 m)

## Video formats supported

- H.264 and protected H.264 (from iTunes Store): Up to 5 Mbps, Progressive Main Profile (CAVLC) with AAC-LC audio up to 160 Kbps (maximum resolution: 1280 by 720 pixels at 24 fps, 960 by 540 pixels at 30 fps) in .m4v, .mp4, and .mov file formats
- iTunes Store purchased video: 320 by 240 pixels, 640 by 480 pixels, 720 by 480 pixels (anamorphic), or high-definition 720p
- MPEG-4: Up to 3 Mbps, Simple Profile with AAC-LC audio up to 160 Kbps (maximum resolution: 720 by 432 pixels at 30 fps) in .m4v, .mp4, and .mov file formats

## Audio formats supported

- AAC (16 to 320 Kbps); protected AAC (from iTunes Store); MP3 (16 to 320 Kbps); MP3 VBR; Apple Lossless; AIFF; WAV; Dolby Digital 5.1 surround sound pass-through

## Photo formats supported

- JPEG, BMP, GIF, TIFF, PNG

## TV compatibility

- Compatible with enhanced-definition or high-definition widescreen TVs capable of 1080p/1080i 60/50Hz, 720p 60/50Hz, 576p 50Hz (PAL format), or 480p 60Hz, including popular models from these manufacturers: HP, Hitachi, JVC, LG, Mitsubishi, NEC, Olevia, Panasonic, Philips, Pioneer, Polaroid, Samsung, Sony, Sharp, Toshiba, Vizio, Westinghouse

## In the box

- Apple TV
- Apple Remote
- Power cord
- Quick Start guide



# 19\_Apple TV (1st generation) - Technical Specifications.pdf

## Size and weight

- Footprint: 7.7 by 7.7 inches (197 by 197 mm)
- Height: 1.1 inches (28 mm)
- Weight: 2.4 pounds (1.09 kg)<sup>1</sup>

## Power

- Built-in 48-watt universal power supply

## Accessories

- XtremeMac HDMI to HDMI cable TL951LL/A
- XtremeMac HDMI to DVI cable TL952LL/A
- XtremeMac component video cable TL953LL/A
- XtremeMac analog audio cable TL954LL/A
- XtremeMac TOSLINK optical cable TL955LL/A
- AirPort Extreme Base Station MA073LL/A
- AppleCare Protection Plan MA937LL/A

- 
1. Actual weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Video capacity based on H.264 1.5-Mbps video at 640-by-480-pixel resolution combined with 128-Kbps audio. Actual capacity varies by content.
  4. Music capacity based on 4 minutes per song and 128-Kbps AAC encoding. Actual capacity varies by content.
  5. Photo capacity based on Apple TV-viewable photos transferred from iTunes.
  6. Based on an IEEE 802.11n draft specification. Learn more about the 802.11n draft specification.
  7. Requires HDMI with HDCP or component video.
  8. Dolby Digital 5.1 surround sound is not available with all HD rentals.
  9. Estimated start times based on a 90-minute movie and a sustained Internet connection speed. Times vary based on movie length, broadband connection speed, and other factors. Test your broadband speed at [www.speedtest.net](http://www.speedtest.net).

Broadband Internet access is required.

Published Date: Apr 6, 2016

# AirPort Express 802.11n (1st Generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

- Dimensions: 3.7 inches (94.01 mm) x 2.95 inches (75.00 mm) x 1.12 inches (28.5 mm)
- Weight: 6.7 ounces (188 grams)<sup>1</sup>

## Wireless protocols

- Draft 802.11n<sup>2</sup>
- 802.11a/b/g

## Compatibility

- Interoperable with Wi-Fi Certified 802.11a, 802.11b, and 802.11g and 802.11n draft 2.0 Mac computers, Windows-based PCs, and other Wi-Fi devices
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP, IPv6 (6to4 and manual tunnels)

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>3</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Included software and accessories

- AirPort Utility for Mac and Windows
- 802.11n Enabler for Mac
- Bonjour for Windows
- Printed and electronic documentation

## Interfaces

- 802.11n wireless
- One 10/100 Ethernet port for connecting a DSL, cable modem or Ethernet network
- USB port for connecting a USB printer<sup>5</sup>
- 3.5mm audio minijack for analog or optical digital sound<sup>4</sup>
- Built-in power supply

## Electrical and environmental requirements

- 100-240V AC, 50-60Hz; input current: 0.2 amps
- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13° to 140° F ( -25° to 60° C)
- Relative humidity (operating): 20% to 90%, noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Frequency bands

- 2.4GHz or 5GHz

## Radio output power

- 20 dBm (nominal)

## Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268:

# 1\_AirPort Express 802.11n (1st Generation) - Technical Specifications.pdf

2003, UL 60950, CSA-C22.2 No. 60950

## Channels

- Channels 1-11, 36-48, and 149-165 approved for use in the United States and Canada
- Channels 1-14 and 36-64 approved for use in Japan
- Channels 1-13 and 36-140 approved for use in Europe
- Channels 1-13, 36-64 and 149-165 approved for use in Australia, Hong Kong, and New Zealand

## System Requirements

	For Mac Users	For PC Users
For wireless client access	Mac with AirPort or AirPort Extreme wireless capability	PC with 802.11a/b/g or 802.11n draft 2.0 card
For shared printing with a USB printer	USB printer, Mac with Mac OS X v10.2.7 or later	USB printer, PC with Windows XP (SP2) or Windows Vista; Bonjour for Windows (included on AirPort Express CD)
Software	<div>Users with Mac OS X v10.5.7 or later can:<ul style="list-style-type: none"><li>• Access an AirPort Express wireless network</li><li>• Set up an AirPort Express Base Station</li><li>• Use iTunes to play music</li><li>• Share a USB printer</li><li>• Use Wi-Fi Protected Access (WPA/WPA2)</li></ul></div>	<ul style="list-style-type: none"><li>• Windows XP or Windows Vista</li><li>• WPA support requires a Wi-Fi Certified PC solution</li></ul>

## Extended Service and Support

The [AppleCare Protection Plan](#) for your computer covers the AirPort Express Base Station.

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1. Weight varies by configuration and manufacturing process.
  2. The AirPort Express Base Station is based on an IEEE 802.11n draft specification and is compatible with IEEE 802.11a, IEEE 802.11b, and IEEE 802.11g.
  3. Support for WPA requires Mac OS X v10.3 or later. Use of Wi-Fi Protected Access (WPA) reduces the maximum number of network users. When joining an existing wireless network, AirPort Express only supports WPA-Personal. WPA2 requires a Mac computer with an AirPort Extreme Card and Mac OS X v10.3 or later.
  4. Requires compatible stereo system or powered speakers.
  5. Wireless printing over USB requires a compatible printer and Mac OS X v10.2.7 or later or Windows XP, or Windows Vista.

Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort Express.

Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

# Macintosh IIfx: Technical Specifications

## Macintosh IIfx

Logic Board	Ports	Power
Processor: 68030, 16	USB:	Max Watts: 230
PMMU: integrated	ADB: 2	Amps: 1.9
FPU: opt. 68882	Video: DB-15	BTU per Hr: 786.6
Data Path: 32, 16	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 3 NuBus, 1 PDS	FireWire:	Pass Through: yes
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K) Video Memory 1MB VRAM (2x512K)
RAM Slots: 4, 30-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 68 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 256K, 1, 2, 4, 16 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 4	832 x 624	n/a-bit n/a-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 10/19/1992	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 2/10/1993	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: IIfx	Orig Enabler: System Enabler 001	Min. Int HD Size: 40-400MB
Gestalt ID: 44	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 6 H x 13 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
Notes: This system is not sold in the U.S.	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1	

Published Date: Jul 26, 2017

# Macintosh IIfx: Technical Specifications

## Macintosh IIfx

Logic Board	Ports	Power
Processor: 68030, 32	USB:	Max Watts: 230
PMMU: integrated	ADB: 2	Amps: 1.9
FPU: 68882	Video: DB-15	BTU per Hr: 786.6
Data Path: 32, 16	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 32K	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 3 NuBus, 1 PDS	FireWire:	Pass Through: yes
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K) Video Memory 1MB VRAM (2x512K)
RAM Slots: 4, 30-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 68 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 256K, 1, 2, 4, 16M B	800 x 600	n/a-bit n/a-bit
Install in Groups of: 4	832 x 624	n/a-bit n/a-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 10/19/1992	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 10/21/1993	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: IIfx	Orig Enabler: System Enabler 001	Min. Int HD Size: 40-400MB
Gestalt ID: 48	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 6 H x 13 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1	

Published Date: Jul 26, 2017

# Macintosh IIfx: Technical Specifications

## Macintosh IIfx

Logic Board		Ports	Power
Processor:	68030, 40	USB:	Max Watts: 230
PMMU:	integrated	ADB:	Amps: 1.9
FPU:	68882	Video:	BTU per Hr: 786.6
Data Path:	32, 40	Floppy:	Voltage: 100-240
L1 Cache:	0.5K	SCSI:	Freq Range: 48-62 Hz
L2 Cache:	32K	Geoports:	Battery Type: 3.6V lithium
2nd Processor:	none	Ethernet:	Soft Power: yes
Slots:	6 NuBus, 1 PDS	FireWire:	Pass Through: yes
		Mic Type:	
		AirPort Ready:	
		Other Ports:	
		Printer	
		Modem	
		Speaker	
		,	
Memory		Video Memory	
Logic Board:	none	Resolution	Video Memory requires video card (n/a)
RAM Slots:	8, 64-pin SIMM	512 x 384	n/a-bit
Min - Max RAM:	4 MB - 128 MB	640 x 400	n/a-bit
Min RAM Speed:	80	640 x 480	n/a-bit
RAM Sizes:	1, 4, 16 MB	800 x 600	n/a-bit
Install in Groups of:	4	832 x 624	n/a-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
Physical		Software	Storage
Introduced:	3/19/1990	Addressing Modes:	Floppy Size: 1.44MB (x2)
Discontinued:	4/15/1992	Orig SSW:	Floppy Inject: auto
Form Factor:	II	Orig Enabler:	Min. Int HD Size: 40-160MB
Gestalt ID:	13	ROM ID:	Int HD Interface: SCSI
Weight (lbs):	24	ROM Ver:	Orig CD Speed n/a
Dimensions (in):	5.5 H x 18.7 W x 14.4 D	ROM Size:	Int CD Support:
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	
		Mac OS	
		Supported:	
		6.0.5	
		6.0.7	
		6.0.8	
		7.0	
		7.0.1	
		7.1	
		7.1.1 (Pro)	
		7.5	
		7.5.1	
		7.5.3	
		7.5.5	

# Macintosh Classic II: Technical Specifications

## Macintosh Classic II

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	76
PMMU:	integrated	ADB: 1		Amps:	.63
FPU:	none	Video: none		BTU per Hr:	259.92
Data Path:	16, 16	Floppy: DB-19		Voltage:	120
L1 Cache:	0.5K	SCSI: DB-25		Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type: 3.6V lithium	
2nd Processor:	none	Ethernet: none			
Slots:	none	FireWire:			
		Mic Type: Omni			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
Memory		Video Memory			
Logic Board:	2 MB	Resolution	Video Memory built-in CRT (built in)		
RAM Slots:	2, 30-pin SIMM	512 x 384	1-bit		
Min - Max RAM:	2 MB - 10 MB	640 x 400	n/a-bit		
Min RAM Speed:	100	640 x 480	n/a-bit		
RAM Sizes:	1, 2, 4 MB	800 x 600	n/a-bit		
Install in Groups of:	2	832 x 624	n/a-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
		Notes: Screen size is 512x342.			
Physical		Software		Storage	
Introduced:	10/21/1991	Addressing Modes: 24-, 32-bit		Floppy Size:	1.44MB
Discontinued:	9/13/1993	Orig SSW: 7.0.1		Floppy Inject:	auto
Form Factor:	Classic	Orig Enabler: none		Min. Int HD Size:	40-80MB
Gestalt ID:	23	ROM ID: \$067C		Int HD Interface:	SCSI
Weight (lbs):	16	ROM Ver: n/a		Orig CD Speed	n/a
Dimensions (in):	13.2 H x 9.7 W x 11.2 D	ROM Size: 512K		Int CD Support:	
Notes:	Support Discontinued 9/1/98	AppleTalk Ver: 56.0.2			
		Mac OS	7.0.1		
		Supported:	7.1		
			7.1.1 (Pro)		
			7.5		
			7.5.1		
			7.5.3		
			7.5.5		
			7.6		
			7.6.1		

# Macintosh LC: Technical Specifications

## Macintosh LC

Logic Board		Ports		Power	
Processor:	68020, 16	USB:		Max Watts:	50
PMMU:	none	ADB:	1	Amps:	.42
FPU:	none	Video:	DB-15	BTU per Hr:	171
Data Path:	16, 16	Floppy:	none	Voltage:	90-240
L1 Cache:	0.25K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none		
Slots:	1 LC PDS	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	2 MB	Resolution	Video Memory 256K VRAM (1x256K)	Video Memory 512K VRAM (1x512K)	
RAM Slots:	2, 30-pin SIMM	512 x 384	8-bit	16-bit	
Min - Max RAM:	2 MB - 10 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	100	640 x 480	4-bit	8-bit	
RAM Sizes:	1, 2, 4 MB	800 x 600	n/a-bit	n/a-bit	
Install in Groups of:	2	832 x 624	n/a-bit	n/a-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	10/15/1990	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	3/23/1992	Orig SSW:	6.0.7	Floppy Inject:	auto
Form Factor:	LC	Orig Enabler:	none	Min. Int HD Size:	40-80MB
Gestalt ID:	19	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	8.8	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	2.9 H x 12.2 W x 15.3 D	ROM Size:	512K	Int CD Support:	
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	54		
		Mac OS Supported:	6.0.7 6.0.8 7.0 7.0.1 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5		



# Macintosh LC II: Technical Specifications

## Macintosh LC II

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	50
PMMU:	integrated	ADB:	1	Amps:	.42
FPU:	none	Video:	DB-15	BTU per Hr:	171
Data Path:	16, 16	Floppy:	none	Voltage:	90-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none		
Slots:	1 LC PDS	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 256K VRAM (1x256K)	Video Memory 512K VRAM (1x512K)	
RAM Slots:	2, 30-pin SIMM	512 x 384	8-bit	16-bit	
Min - Max RAM:	4 MB - 10 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	100	640 x 480	4-bit	8-bit	
RAM Sizes:	1, 2, 4 MB	800 x 600	n/a-bit	n/a-bit	
Install in Groups of:	2	832 x 624	n/a-bit	n/a-bit	
Notes:	When all SIMM slots are filled with 4MB SIMMs, the lower 2MB of RAM on the logic board cannot be addressed.	1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	3/23/1992	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	3/15/1993	Orig SSW:	7.0.1	Floppy Inject:	auto
Form Factor:	LC	Orig Enabler:	none	Min. Int HD Size:	40-80MB
Gestalt ID:	37	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	8.8	ROM Ver:	\$19	Orig CD Speed:	n/a
Dimensions (in):	2.9 H x 12.2 W x 15.3 D	ROM Size:	512K	Int CD Support:	
Notes:	Support Discontinued 9/1/98	AppleTalk Ver:	54		
		Mac OS Supported:	7.0.1 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

# Macintosh Color Classic: Technical Specifications

## Macintosh Color Classic

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	100
PMMU:	integrated	ADB:	2	Amps:	.83
FPU:	opt. 68882	Video:	none	BTU per Hr:	342
Data Path:	16, 16	Floppy:	none	Voltage:	90-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	1 LC PDS	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 256K VRAM (built in)	Video Memory 512K VRAM (1x256K)	
RAM Slots:	2, 30-pin SIMM	512 x 384	8-bit	16-bit	
Min - Max RAM:	4 MB - 10MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	100	640 x 480	n/a-bit	n/a-bit	
RAM Sizes:	1, 2, 4 MB	800 x 600	n/a-bit	n/a-bit	
Install in Groups of:	2	832 x 624	n/a-bit	n/a-bit	
Notes:	When all SIMM slots are filled with 4MB SIMMs, the lower 2MB of RAM on the logic board cannot be addressed.	1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	2/10/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	5/16/1994	Orig SSW:	7.1	Floppy Inject:	auto
Form Factor:	Color Classic	Orig Enabler:	System Enabler 401	Min. Int HD Size:	40-160MB
Gestalt ID:	49	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	22.5	ROM Ver:	\$24	Orig CD Speed	n/a
Dimensions (in):	14.5 H x 9.9 W x 12.6 D	ROM Size:	1MB	Int CD Support:	
		AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

# Macintosh Color Classic II: Technical Specifications

## Macintosh Color Classic II

Logic Board		Ports		Power	
Processor:	68030, 33	USB:		Max Watts:	100
PMMU:	integrated	ADB:	2	Amps:	.83
FPU:	opt. 68882	Video:	none	BTU per Hr:	342
Data Path:	32, 33	Floppy:	none	Voltage:	90-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	1 LC PDS	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 256K VRAM (built in)	Video Memory 512K VRAM (1x256K)	
RAM Slots:	1, 72-pin SIMM	512 x 384	8-bit	16-bit	
Min - Max RAM:	4 MB - 36 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	80	640 x 480	n/a-bit	n/a-bit	
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit	n/a-bit	
Install in Groups of:	1	832 x 624	n/a-bit	n/a-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	10/21/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	J-7.1	Floppy Inject:	auto
Form Factor:	Color Classic	Orig Enabler:	System Enabler 403	Min. Int HD Size:	80-160MB
Gestalt ID:	83	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	22.5	ROM Ver:	\$24	Orig CD Speed	n/a
Dimensions (in):	14.5 H x 9.9 W x 12.6 D	ROM Size:	1MB	Int CD Support:	
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

# Macintosh LC III: Technical Specifications

## Macintosh LC III

Logic Board	Ports	Power
Processor: 68030, 25	USB:	Max Watts: 50
PMMU: integrated	ADB: 1	Amps: .42
FPU: opt. 68882	Video: DB-15	BTU per Hr: 171
Data Path: 32, 25	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	
Slots: 1 LC III PDS	FireWire:	
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 768K VRAM (1x256K)
RAM Slots: 1, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	16-bit 16-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
	Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.	
Physical	Software	Storage
Introduced: 2/10/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 2/14/1994	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: LC	Orig Enabler: System Enabler 003	Min. Int HD Size: 80-160MB
Gestalt ID: 27	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 8.8	ROM Ver: \$22	Orig CD Speed n/a
Dimensions (in): 2.9 H x 12.2 W x 15.3 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS 7.1	
	Supported: 7.5	
	7.1.1 (Pro)	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	

# AirPort Extreme 802.11n (1st Generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight<sup>1</sup>

- Length: 6.5 inches (165 mm)
- Width: 6.5 inches (165 mm)
- Height: 1.3 inches (34 mm)
- Weight: 1.66 pounds (753 grams)

## Wireless protocols

- 802.11a/b/g
- Draft 802.11n<sup>2</sup>

## Frequency bands

- 2.4GHz or 5GHz

## Radio output power

- 20 dBm (nominal)

## Compatibility

- AirPort Extreme is Wi-Fi certified for 802.11n draft 2.0 (Firmware version 7.2.1)
- Interoperable with Wi-Fi Certified 802.11a, 802.11b, and 802.11g Mac computers and Windows-based PCs
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP

## Included software and accessories

- AirPort Utility for Mac and Windows
- AirPort Disk Utility for Mac and Windows
- 802.11n Enabler for Mac
- Bonjour for Windows
- Power cord
- Printed and electronic documentation

## Security

- Wi-Fi Protected Access (WPA/WPA2)<sup>3</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Interfaces

- One 100 Megabit Ethernet WAN port for connecting a DSL or cable modem
- Three 100 Megabit Ethernet LAN ports for connecting computers or network devices
- USB port for connecting a USB printer or USB external hard drive
- 802.11n wireless

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13° to 140° F ( -25° to 60° C)
- Relative humidity (operational): 20% to 80%
- Relative humidity (storage): 10% to 90%
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Agency approvals

## 20\_AirPort Extreme 802.11n (1st Generation) - Technical Specifications.pdf

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268: 2003, UL 60950, CSA-C22.2 No. 60950

### Channels

- Channels 1-11, 36-48, and 149-165 approved for use in the United States and Canada.
- Channels 1-14, 36-64 approved for use in Japan
- Channels 1-13, 36-140 approved for use in Europe
- Channels 1-13, 36-64 approved for use in Australia, Hong Kong and New Zealand

### Electrical

- 12Vdc, 1.8A

System Requirements	For Macintosh Users	For PC Users
<b>For setup and administration</b>	<ul style="list-style-type: none"><li>• Mac with Ethernet or wireless networking capability</li><li>• Mac OS X v10.4.8 or later</li></ul>	<ul style="list-style-type: none"><li>• PC with Ethernet or wireless networking capability</li><li>• Windows XP with SP2 or later</li></ul>
<b>For wireless client access</b>	Mac with AirPort or AirPort Extreme wireless capability	PC with 802.11a, 802.11b, or 802.11g card
<b>For shared printing with a USB printer</b>	Mac with Mac OS X v10.2.7 or later	PC with Windows XP; Bonjour for Windows included on AirPort Extreme CD
<b>For AirPort Disk with a USB hard drive</b>	Mac with Mac OS X v10.4.8 or later	PC with Windows XP; Bonjour for Windows included on AirPort Extreme CD
<b>Extended Service and Support</b>	The AppleCare Protection Plan for your computer covers the AirPort Extreme Base Station.	

1. Weight varies by configuration and manufacturing process.
2. The AirPort Extreme Base Station is based on an IEEE 802.11n draft specification and is compatible with IEEE 802.11a, IEEE 802.11b, and IEEE 802.11g.
3. Support for Wi-Fi Protected Access (WPA/WPA2) requires Mac OS X v10.3 or later or Windows XP with SP2 or later.

Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort Extreme.

Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

# Macintosh LC III+: Technical Specifications

## Macintosh LC III+

Logic Board	Ports	Power
Processor: 68030, 33	USB:	Max Watts: 50
PMMU: integrated	ADB: 1	Amps: .42
FPU: opt. 68882	Video: DB-15	BTU per Hr: 171
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	
Slots: 1 LC III PDS	FireWire:	
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 768K VRAM (1x256K)
RAM Slots: 1, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	16-bit 16-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
	Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.	
Physical	Software	Storage
Introduced: 10/18/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 2/14/1994	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: LC	Orig Enabler: System Enabler 003 v1.1	Min. Int HD Size: 80-160MB
Gestalt ID: 62	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 8.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.9 H x 12.2 W x 15.3 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.5 7.5.1 7.1 7.1.1 (Pro) 7.5.3 7.5.5 7.6 7.6.1	

# Macintosh LC 475: Technical Specifications

## Macintosh LC 475

Logic Board	Ports	Power
Processor: 68LC040, 50	USB:	Max Watts: 30
PMU: integrated	ADB: 1	Amps: .25
FPU: none	Video: DB-15	BTU per Hr: 102.6
Data Path: 32, 25	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	
Slots: 1 LC III PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K) Video Memory 1MB VRAM (2x512K)
RAM Slots: 1, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 10/21/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 7/15/1996	Orig SSW: 7.1	Floppy Inject: manual
Form Factor: LC	Orig Enabler: System Enabler 065	Min. Int HD Size: 80-250MB
Gestalt ID: 89	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 8.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.9 H x 12.2 W x 15.3 D	ROM Size: 512k*	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	
	Notes: ROM = 512k: expandable to 1MB	

Published Date: Jul 26, 2017



# Macintosh Performa 200: Technical Specifications

## Macintosh Performa 200

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	76
PMMU:	integrated	ADB:		Amps:	.63
FPU:	none	Video:		BTU per Hr:	259.92
Data Path:	16, 16	Floppy:		Voltage:	120
L1 Cache:	0.5K	SCSI:		Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type: 3.6V lithium	
2nd Processor:	none	Ethernet:			
Slots:	none	FireWire:			
		Mic Type:			Omni
		AirPort Ready:			
		Other Ports:			Printer Modem Speaker ,
Memory		Video Memory			
Logic Board:	2 MB	Resolution	Video Memory built-in CRT (built in)		
RAM Slots:	2, 30-pin SIMM	512 x 384	1-bit		
Min - Max RAM:	2 MB - 10 MB	640 x 400	n/a-bit		
Min RAM Speed:	100	640 x 480	n/a-bit		
RAM Sizes:	1, 2, 4 MB	800 x 600	n/a-bit		
Install in Groups of:	2	832 x 624	n/a-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
		Notes: Screen size is 512x342.			
Physical		Software		Storage	
Introduced:	9/14/1992	Addressing Modes: 24-, 32-bit		Floppy Size:	1.44MB
Discontinued:	10/18/1993	Orig SSW:		Floppy Inject:	auto
Form Factor:	Classic	Orig Enabler:		Min. Int HD Size:	40-80MB
Gestalt ID:	23	ROM ID:		Int HD Interface:	SCSI
Weight (lbs):	16	ROM Ver:		Orig CD Speed	n/a
Dimensions (in):	13.2 H x 9.7 W x 11.2 D	ROM Size:		Int CD Support:	
		AppleTalk Ver:			
		Mac OS			
		Supported:			
		7.0.1P			
		7.1P			
		7.1			
		7.1P1			
		7.1P2			
		7.1P3			
		7.1P5			
		7.1P6			
		7.5			
		7.5.1			
		7.5.3			
		7.5.5			
		7.6			
		7.6.1			

# Macintosh LC 520: Technical Specifications

## Macintosh LC 520

Logic Board	Ports	Power
Processor: 68030, 25	USB:	Max Watts: 40
PMMU: integrated	ADB: 2	Amps: .5
FPU: opt. 68882	Video: none	BTU per Hr: 136.8
Data Path: 32, 25	Floppy: none	Voltage: 90-264
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 1 LC PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,	
Memory	Video Memory	
Logic Board: 4M B	Resolution	Video Memory 512K VRAM (built in) Video Memory 768K VRAM (1x256K)
RAM Slots: 1, 72-pin SIMM	512 x 384	n/a-bit n/a-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit n/a-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 6/28/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 2/2/1994	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: LC 520	Orig Enabler: System Enabler 403 v1.0	Min. Int HD Size: 80-160MB
Gestalt ID: 56	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 40.5	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 17.9 H x 13.5 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS 7.1	
	Supported: 7.5	
	7.1.1 (Pro)	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	

Published Date: Jul 26, 2017

# Macintosh LC 550: Technical Specifications

## Macintosh LC 550

Logic Board	Ports	Power
Processor: 68030, 33	USB:	Max Watts: 40
PMMU: integrated	ADB: 2	Amps: .5
FPU: opt. 68882	Video: none	BTU per Hr: 136.8
Data Path: 32, 33	Floppy: none	Voltage: 90-264
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 1 LC PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer, Modem, Speaker, Headphone, ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 768K VRAM (1x256K)
RAM Slots: 1, 72-pin SIMM	512 x 384	n/a-bit n/a-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit n/a-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 2/2/1994	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 3/23/1995	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: LC 520	Orig Enabler: System Enabler 403 v1.0.2	Min. Int HD Size: 160MB
Gestalt ID: 80	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 40.5	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 17.9 H x 13.5 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1, 7.5, 7.1.1 (Pro), 7.5.1, 7.5.3, 7.5.5, 7.6, 7.6.1	

Published Date: Jul 26, 2017

# Macintosh TV: Technical Specifications

## Macintosh TV

Logic Board	Ports	Power
Processor: 68030, 32	USB:	Max Watts: 60
PMMU: integrated	ADB: 2	Amps: .5
FPU: none	Video: none	BTU per Hr: 205.2
Data Path: 32, 16	Floppy: none	Voltage: 90-264
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: none	FireWire:	
	Mic Type: none	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (built in)
RAM Slots: 1, 72-pin SIMM	512 x 384	n/a-bit
Min - Max RAM: 4 MB - 8 M B	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	8-bit
RAM Sizes: 1, 4 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 10/25/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.1	Floppy Inject: manual
Form Factor: LC 520	Orig Enabler: System Enabler 404	Min. Int HD Size: 160MB
Gestalt ID: 88	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 40.5	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 17.9 H x 13.5 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1	

# Macintosh Performa 250: Technical Specifications

Macintosh Performa 250

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	100
PMMU:	integrated	ADB:	2	Amps:	.83
FPU:	opt. 68882	Video:	none	BTU per Hr:	342
Data Path:	16, 16	Floppy:	none	Voltage:	90-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	1 LC PDS	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 256K VRAM (built in)	Video Memory 512K VRAM (1x256K)	
RAM Slots:	2, 30-pin SIMM	512 x 384	8-bit	16-bit	
Min - Max RAM:	4 MB - 10 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	100	640 x 480	n/a-bit	n/a-bit	
RAM Sizes:	1, 2, 4 MB	800 x 600	n/a-bit	n/a-bit	
Install in Groups of:	2	832 x 624	n/a-bit	n/a-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	2/1/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	5/1/1994	Orig SSW:	7.1	Floppy Inject:	auto
Form Factor:	Color Classic	Orig Enabler:	System Enabler 401	Min. Int HD Size:	40-160MB
Gestalt ID:	49	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	22.5	ROM Ver:	\$24	Orig CD Speed	n/a
Dimensions (in):	14.5 H x 9.9 W x 12.6 D	ROM Size:	1MB	Int CD Support:	
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

Published Date: Jul 25, 2017

# Macintosh Performa 275: Technical Specifications

## Macintosh Performa 275

Logic Board		Ports		Power	
Processor:	68030, 33	USB:		Max Watts:	100
PMMU:	integrated	ADB:	2	Amps:	.83
FPU:	opt. 68882	Video:	none	BTU per Hr:	342
Data Path:	32, 33	Floppy:	none	Voltage:	90-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	1 LC PDS	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 256K VRAM (built in)	Video Memory 512K VRAM (1x256K)	
RAM Slots:	1, 72-pin SIMM	512 x 384	8-bit	16-bit	
Min - Max RAM:	4 MB - 36 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	80	640 x 480	n/a-bit	n/a-bit	
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit	n/a-bit	
Install in Groups of:	1	832 x 624	n/a-bit	n/a-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	10/1/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	J-7.1	Floppy Inject:	auto
Form Factor:	Color Classic	Orig Enabler:	System Enabler 403	Min. Int HD Size:	80-160MB
Gestalt ID:	83	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	22.5	ROM Ver:	\$24	Orig CD Speed	n/a
Dimensions (in):	14.5 H x 9.9 W x 12.6 D	ROM Size:	1MB	Int CD Support:	
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

# Xserve RAID (Early 2007) - Technical Specifications

This article has been archived and is no longer updated by Apple.

Configurations			
Order No.	1TB Xserve RAID M9721LL/A	3.5TB Xserve RAID MA 208LL/A	7TB Xserve RAID MA 209LL/A
Ultra ATA Apple Drive Modules (7200 rpm)	Four 250GB drives	Seven 500GB drives	Fourteen 500GB drives
Controller cache	512MB per controller		
Total available storage-RAID 0 <sup>(1)</sup>	1TB	3.5TB	7TB
Usable storage-RAID 1 <sup>(1)</sup>	500GB	1.5TB	3TB
Usable storage-RAID 3 and 5 <sup>(1)</sup>	750GB	3TB	6TB
On-drive cache	8MB per drive	8MB per drive	8MB per drive
Expansion	Fourteen bays with independent Ultra ATA channels for up to 10.5TB of storage		
Also included	Mounting screws with M5, M6 and 10/32-inch threads; caged nuts; two agency-approved 12-foot power cables		
Service and support	90 days of free telephone support and one-year limited warranty. Optional AppleCare Support plans are available.		

Specifications	
RAID controllers and cache memory	<ul style="list-style-type: none"><li>Dual independent controllers, each with environment management coprocessor for out-of-band remote management and monitoring</li><li>512MB of cache per controller (1GB total)</li><li>Cache Backup Battery Modules (sold separately) for over 72 hours of memory protection</li></ul>
RAID operation	<ul style="list-style-type: none"><li>Support for RAID levels: 0, 1, 3, 5, 0+1,10, 30, 50 (10, 30 and 50 require host-based software RAID)</li><li>Support for multiple RAID sets</li><li>Background RAID set creation; automatic variable background rebuilding; online expansion; LUN slicing; global drive hot sparing (per RAID controller) <sup>(2)</sup></li></ul>
Fibre Channel storage-to-host connection	<ul style="list-style-type: none"><li>Dual 2Gb Fibre Channel ports (SFP), 200MB/s throughput per channel with guaranteed delivery (400MB/s full duplex) <sup>(3)</sup></li><li>Host connectivity using 2Gb and 4Gb Apple Fibre Channel PCI Express and Apple Fibre Channel PCI-X card (cards sold separately) or compatible third-party PCI card</li><li>Support for point-to-point, loop and fabric (switched) topologies</li><li>Dual 10/100BASE-T Ethernet for remote management</li></ul>
Apple Fibre Channel PCI Express Card (sold separately)	<ul style="list-style-type: none"><li>Dual- or Quad-channel 2Gb or 4Gb Fibre Channel PCI Express Bus Adapter</li><li>Runs at full bandwidth in a four-lane or eight-lane PCI Express slot; not compatible with PCI or PCI-X</li><li>Two or four 2.9-meter 2Gb or 4Gb Fibre Channel copper cables with embedded SFP transceivers; compatible with SFP fiber-optic cables and transceivers</li></ul>
Apple Fibre Channel PCI-X Card (sold separately)	<ul style="list-style-type: none"><li>64-bit, 133MHz card with two SFP 2Gb Fibre Channel ports; compatible with 32-bit, 66MHz PCI slots and 64-bit, 100 MHz or 133 MHz PCI-X slots</li><li>Two 2.9-meter Fibre Channel copper cables with embedded SFP transceivers; compatible with SFP fiber-optic cables and transceivers</li></ul>

# 21\_Xserve RAID (Early 2007) - Technical Specifications.pdf

Supported SFP Types	<b>4Gb Short-Haul Transceiver (supports up to 500m with 50/125 m MMF)</b> <ul style="list-style-type: none"><li>■ <b>Finisar</b> FTLF-8524-P2BNL</li><li>■ <b>Finisar</b> FTLF-8524-P2BNL-LS</li></ul> <b>2Gb Short-Haul Transceiver (supports up to 500m with 50/125 m MMF)</b> <ul style="list-style-type: none"><li>■ <b>Finisar</b> FTRJ-8519-P1BNL</li><li>■ <b>Pico Light</b> PL-XPL-VE-S24-11</li><li>■ <b>Pico Light</b> PL-XPL-VC-S23-11</li><li>■ <b>JDS Uniphase</b> JSM-21S0AA1</li><li>■ <b>JDS Uniphase</b> JSP-21S0AA1</li><li>■ <b>JDS Uniphase</b> JDS-42S4AA1</li></ul> <b>2Gb Long-Haul Transceiver (supports up to 10km with 9/125 m SMF)</b> <ul style="list-style-type: none"><li>■ <b>Finisar</b> FTRJ-1319-P1BTL</li></ul>
Cooling	<ul style="list-style-type: none"><li>■ Redundant hot-swap cooling modules with self-regulating speeds and front-to-back cooling</li><li>■ Environmental monitoring system for automatically maintaining optimal ambient temperature</li></ul>
Electrical requirements	<ul style="list-style-type: none"><li>■ Redundant load-sharing hot-swap power supplies (450W); universal input (100V to 240V AC), power factor corrected</li><li>■ Maximum input current: 7.6A (100V to 127V) or 3.6A (200V to 240V)</li><li>■ Power usage: 300W typical continuous power, 400W maximum continuous power</li><li>■ Dual DB-9 serial ports for UPS systems</li><li>■ Frequency: 50Hz to 60Hz, single phase</li></ul>
Environmental requirements	<ul style="list-style-type: none"><li>■ Operating temperature: 50° to 95° F (10° to 35° C)</li><li>■ Storage temperature: -40° to 116° F ( -40° to 47° C)</li><li>■ Relative humidity: 5% to 95% noncondensing</li><li>■ Maximum thermal output: 1365 BTUs per hour</li><li>■ Maximum altitude: 10,000 feet</li><li>■ FCC Class A approved</li></ul>
Size and weight	<ul style="list-style-type: none"><li>■ 3U rack-optimized: 5.25 inches (13.3 cm) high by 17 inches (43.2 cm) wide by 18.4 inches (46.7 cm) deep</li><li>■ Fits EIA-310-D-compliant industry-standard 19-inch-wide four-post racks from 24 to 36 inches deep; deeper racks require third-party extender</li><li>■ 60-100 pounds (27-45 kg), depending on configuration <sup>(4)</sup></li></ul>

1. For hard drive capacity measurements, 1Gb = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.  
2. Automatic rebuild requires a designated hot spare; not available for RAID level 0.  
3. Actual rates will vary depending on configuration and RAID level.  
4. Weight varies by configuration and manufacturing process.

Product specifications are subject to change without notice.

Published Date: Apr 6, 2016



# Macintosh Performa 400:Technical Specifications

Macintosh Performa 400

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	50
PMMU:	integrated	ADB:	1	Amps:	.42
FPU:	none	Video:	DB-15	BTU per Hr:	171
Data Path:	16, 16	Floppy:	none	Voltage:	90-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none		
Slots:	1 LC PDS	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Video Memory			
RAM Slots:	2, 30-pin SIMM	256K VRAM			
Min - Max RAM:	4 MB - 10 MB	Video Memory			
Min RAM Speed:	100	512K VRAM			
RAM Sizes:	1, 2, 4 MB	(1x256K )			
Install in Groups of:	2	(1x512K)			
Notes:	When all SIMM slots are filled with 4MB SIMMs, the lower 2MB of RAM on the logic board cannot be addressed.	Resolution			
		512 x 384	8-bit	16-bit	
		640 x 400	n/a-bit	n/a-bit	
		640 x 480	4-bit	8-bit	
		800 x 600	n/a-bit	n/a-bit	
		832 x 624	n/a-bit	n/a-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
		Notes: This system ships with 512K of VRAM.			
Physical		Software		Storage	
Introduced:	9/14/1992	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	10/18/1993	Orig SSW:	7.0.1P	Floppy Inject:	auto
Form Factor:	LC	Orig Enabler:	none	Min. Int HD Size:	80-120MB
Gestalt ID:	37	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	8.8	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	2.9 H x 12.2 W x 15.3 D	ROM Size:	512K	Int CD Support:	
		AppleTalk Ver:	54		
		Mac OS Supported:	7.1P 7.1P1 7.1P2 7.1P3 7.1P5 7.1P6 7.5 7.0.1P 7.5.1 7.5.3 7.5.5 7.6 7.6.1		



# Macintosh Quadra 605: Technical Specifications

## Macintosh Quadra 605

Logic Board	Ports	Power
Processor: 68LC040, 25	USB:	Max Watts: 30
PMU: integrated	ADB: 1	Amps: .44
FPU: none	Video: DB-15	BTU per Hr: 102.6
Data Path: 32, 25	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	
Slots: 1 LC III PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K )
RAM Slots: 1, 72-pin SIMM		Video Memory 1MB VRAM (2x512K)
Min - Max RAM: 4 MB - 36 MB	512 x 384	16-bit
Min RAM Speed: 80	640 x 400	n/a-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	640 x 480	8-bit
Install in Groups of: 1	800 x 600	n/a-bit
	832 x 624	8-bit
	1024 x 768	4-bit
	1152 x 870	4-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 10/21/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 10/17/1994	Orig SSW: 7.1	Floppy Inject: manual
Form Factor: LC	Orig Enabler: System Enabler 065	Min. Int HD Size: 80-160MB
Gestalt ID: 94	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 8.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.9 H x 12.2 W x 15.3 D	ROM Size: 512k*	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1	
	Notes: ROM = 512k: expandable to 1MB	


# Macintosh Performa 405:Technical Specifications

Macintosh Performa 405

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	50
PMMU:	integrated	ADB:	1	Amps:	.42
FPU:	none	Video:	DB-15	BTU per Hr:	171
Data Path:	16, 16	Floppy:	none	Voltage:	90-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none		
Slots:	1 LC PDS	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Video Memory		Video Memory	
RAM Slots:	2, 30-pin SIMM	Resolution	256K VRAM	512K VRAM	
Min - Max RAM:	4 MB - 10 MB		(1x256K )	(1x512K)	
Min RAM Speed:	100	512 x 384	8-bit	16-bit	
RAM Sizes:	1, 2, 4 MB	640 x 400	n/a-bit	n/a-bit	
Install in Groups of:	2	640 x 480	4-bit	8-bit	
Notes:	When all SIMM slots are filled with 4MB SIMMs, the lower 2MB of RAM on the logic board cannot be addressed.	800 x 600	n/a-bit	n/a-bit	
		832 x 624	n/a-bit	n/a-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	4/12/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.0.1P	Floppy Inject:	auto
Form Factor:	LC	Orig Enabler:	none	Min. Int HD Size:	80-120MB
Gestalt ID:	37	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	8.8	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	2.9 H x 12.2 W x 15.3 D	ROM Size:	512K	Int CD Support:	
		AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1P 7.1P1 7.1P2 7.1P3 7.1P5 7.1P6 7.5 7.0.1P 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

# Macintosh Centris 610: Technical Specifications

## Macintosh Centris 610

Logic Board	Ports	Power
Processor: 68LC040, 20	USB:	Max Watts: 86
PMMU: integrated	ADB: 2	Amps: 1.7
FPU: none	Video: DB-15	BTU per Hr: 294.12
Data Path: 32, 20	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: opt. AAUI-15	Pass Through: yes
Slots: one 7  NuBus or PDS	FireWire:	
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 1MB VRAM (2x256K)
RAM Slots: 2, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 68 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	8-bit 16-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 2/10/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 10/21/1993	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: Centris 610	Orig Enabler: System Enabler 040 v1.0	Min. Int HD Size: 80-500MB
Gestalt ID: 52	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	

# Macintosh Performa 410:Technical Specifications

Macintosh Performa 410

Logic Board		Ports		Power		
Processor:	68030, 16	USB:		Max Watts:	50	
PMMU:	integrated	ADB:	1	Amps:	.42	
FPU:	none	Video:	DB-15	BTU per Hr:	171	
Data Path:	16, 16	Floppy:	none	Voltage:	90-240	
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	50-60 Hz	
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium	
2nd Processor:	none	Ethernet:	none			
Slots:	1 LC PDS	FireWire:				
		Mic Type:	Omni			
		AirPort Ready:				
		Other Ports:	Printer Modem Speaker ,			
Memory		Video Memory				
Logic Board:	4 MB	Resolution	Video Memory 256K VRAM		Video Memory 512K VRAM (1x512K)	
RAM Slots:	2, 30-pin SIMM		(1x256K )			
Min - Max RAM:	4 MB - 10 MB		512 x 384	8-bit		16-bit
Min RAM Speed:	100		640 x 400	n/a-bit		n/a-bit
RAM Sizes:	1, 2, 4 MB		640 x 480	4-bit		8-bit
Install in Groups of:	2		800 x 600	n/a-bit		n/a-bit
Notes:	When all SIMM slots are filled with 4MB SIMMs, the lower 2MB of RAM on the logic board cannot be addressed.		832 x 624	n/a-bit		n/a-bit
			1024 x 768	n/a-bit		n/a-bit
			1152 x 870	n/a-bit		n/a-bit
			1280 x 1024	n/a-bit		n/a-bit
Physical			Software			Storage
Introduced:	10/18/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB	
Discontinued:	n/a	Orig SSW:	7.1P3	Floppy Inject:	auto	
Form Factor:	LC	Orig Enabler:	none	Min. Int HD Size:	80-120MB	
Gestalt ID:	37	ROM ID:	\$067C	Int HD Interface:	SCSI	
Weight (lbs):	8.8	ROM Ver:	n/a	Orig CD Speed	n/a	
Dimensions (in):	2.9 H x 12.2 W x 15.3 D	ROM Size:	512K	Int CD Support:		
		AppleTalk Ver:	57.0.4			
		Mac OS Supported:	7.1P3 7.1P5 7.1P6 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1			

# Macintosh Quadra 610: Technical Specifications

## Macintosh Quadra 610

Logic Board		Ports		Power	
Processor:	68040, 25	USB:		Max Watts:	210
PMMU:	integrated	ADB:	2	Amps:	1.7
FPU:	optional	Video:	DB-15	BTU per Hr:	718.2
Data Path:	32, 25	Floppy:	none	Voltage:	100-240
L1 Cache:	8K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	opt. Intel 486SX-25	Ethernet:	AAUI-15	Pass Through:	yes
Slots:	one 7 NuBus or PDS	FireWire:			
Notes:	Some units shipped with a 68LC040 processor (no FPU), and some shipped with a full 68040 processor.	Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 512K VRAM (built in)	Video Memory 1MB VRAM (2x256K)	
RAM Slots:	2, 72-pin SIMM	512 x 384	16-bit	16-bit	
Min - Max RAM:	4 MB - 68 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	80	640 x 480	8-bit	16-bit	
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	8-bit	16-bit	
Install in Groups of:	1	832 x 624	8-bit	16-bit	
		1024 x 768	4-bit	8-bit	
		1152 x 870	4-bit	8-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	10/21/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	7/18/1994	Orig SSW:	7.1	Floppy Inject:	auto
Form Factor:	Centris 610	Orig Enabler:	System Enabler 040 v1.1	Min. Int HD Size:	160-230MB
Gestalt ID:	53	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	14	ROM Ver:	\$23	Orig CD Speed	2x
Dimensions (in):	3.4 H x 16.3 W x 15.6 D	ROM Size:	1MB	Int CD Support:	yes
		AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0		

# Macintosh Performa 430:Technical Specifications

Macintosh Performa 430

Logic Board		Ports		Power	
Processor:	68030, 16	USB:		Max Watts:	50
PMMU:	integrated	ADB:	1	Amps:	.42
FPU:	none	Video:	DB-15	BTU per Hr:	171
Data Path:	16, 16	Floppy:	none	Voltage:	90-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none		
Slots:	1 LC PDS	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 256K VRAM (1x256K)	Video Memory 512K VRAM (1x512K)	
RAM Slots:	2, 30-pin SIMM	512 x 384	8-bit	16-bit	
Min - Max RAM:	4 MB - 10 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	100	640 x 480	4-bit	8-bit	
RAM Sizes:	1, 2, 4 MB	800 x 600	n/a-bit	n/a-bit	
Install in Groups of:	2	832 x 624	n/a-bit	n/a-bit	
Notes:	When all SIMM slots are filled with 4MB SIMMs, the lower 2MB of RAM on the logic board cannot be addressed.	1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	4/12/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.1P2	Floppy Inject:	auto
Form Factor:	LC	Orig Enabler:	none	Min. Int HD Size:	80-120MB
Gestalt ID:	37	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	8.8	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	2.9 H x 12.2 W x 15.3 D	ROM Size:	512K	Int CD Support:	
		AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1P2 7.1P3 7.1P5 7.1P6 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1		



# Macintosh Quadra 610 DOS Compatible: Technical Specifications

## Macintosh Quadra 610 DOS Compatible

Logic Board		Ports		Power	
Processor:	68040, 25	USB:		Max Watts:	210
PMMU:	integrated	ADB:	2	Amps:	1.7
FPU:	optional	Video:	DB-15	BTU per Hr:	718.2
Data Path:	32, 25	Floppy:	none	Voltage:	100-240
L1 Cache:	8K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	Intel 486SX-25	Ethernet:	AAUI-15	Pass Through:	yes
Slots:	PDS filled	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
		Port Notes:	PC game port also available.		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 512K VRAM (built in)	Video Memory 1MB VRAM (2x256K)	
RAM Slots:	2, 72-pin SIMM	512 x 384	16-bit	16-bit	
Min - Max RAM:	4 MB - 68 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	80	640 x 480	8-bit	16-bit	
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	8-bit	16-bit	
Install in Groups of:	1	832 x 624	8-bit	16-bit	
Notes:	DOS card can accept one 72-pin SIMM (◆ 80 ns), up to 32MB in size.	1024 x 768	4-bit	8-bit	
		1152 x 870	4-bit	8-bit	
		1280 x 1024	n/a-bit	n/a-bit	
		Notes: 512K RAM for DOS video.			
Physical		Software		Storage	

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Introduced:	2/28/1994	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	6/13/1994	Orig SSW:	7.1	Floppy Inject:	auto
Form Factor:	Centris 610	Orig Enabler:	System Enabler 040 v1.1	Min. Int HD Size:	160-230MB
Gestalt ID:	53	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	14	ROM Ver:	\$23	Orig CD Speed:	2x
Dimensions (in):	3.4 H x 16.3 W x 15.6 D	ROM Size:	1MB	Int CD Support:	yes
		AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0		

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# Macintosh Performa 450:Technical Specifications

Macintosh Performa 450

Logic Board		Ports		Power	
Processor:	68030, 25	USB:		Max Watts:	50
PMMU:	integrated	ADB:	1	Amps:	.42
FPU:	opt. 68882	Video:	DB-15	BTU per Hr:	171
Data Path:	32, 25	Floppy:	none	Voltage:	100-240
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none		
Slots:	1 LC III PDS	FireWire:			
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 512K VRAM (built in)	Video Memory 768K VRAM (1x256K)	
RAM Slots:	1, 72-pin SIMM	512 x 384	16-bit	16-bit	
Min - Max RAM:	4 MB - 36 MB	640 x 400	16-bit	16-bit	
Min RAM Speed:	80	640 x 480	8-bit	16-bit	
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit	n/a-bit	
Install in Groups of:	1	832 x 624	8-bit	16-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
		Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.			
Physical		Software		Storage	
Introduced:	4/12/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.1P2	Floppy Inject:	auto
Form Factor:	LC	Orig Enabler:	System Enabler 308	Min. Int HD Size:	120MB
Gestalt ID:	27	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	8.8	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	2.9 H x 12.2 W x 15.3 D	ROM Size:	1MB	Int CD Support:	
		AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1P2 7.1P3 7.1P5 7.1P6 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

# Macintosh Quadra 630: Technical Specifications

## Macintosh Quadra 630

Logic Board	Ports	Power
Processor: 68040, 33	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.25
FPU: integrated	Video: DB-15	BTU per Hr: 153.9
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: LC, comm, TV, video in	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 4 M B	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 1, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	8-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 7/18/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 4/17/1995	Orig SSW: 7.1.2P	Floppy Inject: manual
Form Factor: Quadra 630	Orig Enabler: System Enabler 405	Min. Int HD Size: 250MB
Gestalt ID: 98	ROM ID: \$067C	Int HD Interface: IDE
Weight (lbs): 19	ROM Ver: \$21	Orig CD Speed 2x
Dimensions (in): 4.3 H x 12.6 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1.2P 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1	

# Xserve (Late 2006) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Hardware

	Base Configuration	Configurable Options
Processor	Two 2GHz Dual-Core Intel Xeon 5100 processors	Two 2.66GHz or 3GHz Dual-Core Intel Xeon 5100 processors
Frontside bus	1.33GHz frontside bus per processor	
L2 cache	4MB shared L2 cache per processor	
Memory	1GB of 667MHz DDR2 ECC FB-DIMM memory	Up to 32GB of ECC FB-DIMM memory using pairs of 512MB, 1GB, 2GB, or 4GB memory modules
Hot-plug storage	Three drive bays with one 80GB 7200-rpm SATA drive installed	Any combination of SATA or SAS Apple Drive Modules: up to 2.25TB using three 750GB 7200-rpm SATA drive modules; or up to 900GB using three 300GB 15,000-rpm SAS drive modules. 80GB 7200-rpm SATA and 73GB 15,000-rpm SAS drive modules also available
Internal RAID	Software RAID 0 and 1 built in to Mac OS X Server	Xserve RAID card with 256MB RAID cache, hardware RAID 0,1 and 5 and integrated 72-hour cache battery backup; supports internal SATA or SAS drives
Optical drive	24x Combo drive (DVD-ROM/CD-RW)	8x double-layer SuperDrive (DVD+R DL/DVD±RW/CD-RW)
I/O connectivity	Two built-in Gigabit Ethernet interfaces (10/100/1000BASE-T); one half-length (6.6-inch), eight-lane PCI Express slot and one 9-inch configurable slot (eight-lane PCI Express or 133MHz PCI-X); two FireWire 800, two USB 2.0, and one DB-9 serial port on back panel; one FireWire 400 port on front panel	
Graphics	Built-in ATI Radeon X1300 PCI Express graphics with 64MB of GDDR3 SDRAM; mini-DVI to VGA adaptor	ATI Radeon X1300 PCI Express graphics card with 256MB of DDR2 memory and dual-link DVI port
PCI Express expansion	Two open x8 PCI Express slots	Apple Fibre Channel PCI Express Card, Apple Dual-Channel Gigabit Ethernet PCI Express Card, Apple Dual-Channel Ultra320 SCSI PCI-X Card
Service and Support	90 days of telephone support and one-year limited warranty	Optional AppleCare extended service and support products available

## Software

	Base Configuration
Mac OS X Server 10.4	Unlimited-Client Edition
Included services	<ul style="list-style-type: none"><li>File and printer sharing: Macintosh (AFP, PAP, IPP), Windows (SMB/CIFS, IPP), UNIX and Linux (NFS, LPR/LPD), Internet (FTP, WebDAV)</li><li>Directory services: Open Directory (OpenLDAP, Kerberos, SASL), NT Domain Services (Samba 3), Backup Domain Controller (BDC)</li><li>Mail services: Postfix (SMTP), Cyrus (IMPAP, POP); webmail (SquirrelMail), mailing lists (Mailman), junk mail filtering (SpamAssassin), virus detection and quarantine (ClamAV)</li><li>Web hosting: Apache web server, JBoss application server (EJB), Apache Tomcat (JSPs, Servlets), MySQL</li><li>Media streaming: QuickTime Streaming Server (H.264, 3GPP, MPEG-4, MP3, AAC, RTP/RTSP), QuickTime Broadcaster, QTSS Publisher</li><li>Collaboration services: iChat Server, Weblog Server</li><li>Desktop management: Workgroup Manager, NetBoot, NetInstall, Software Update Server</li><li>Network and security: DNS, DHCP, NAT, FireWall (IPFW2), VPN server (L2TP, PPTP), NTP</li><li>Management tools: Server Monitor (for Xserve hardware monitoring), Server Admin, Secure Shell (SSH2), SNMPv3</li><li>Distributed computing: Xgrid</li></ul>

## Physical Specifications

	Base Configuration	Configurable Options
Power Supply	Single 650W power supply	Optional second load-sharing 650W power supply

# 22\_Xserve (Late 2006) - Technical Specifications.pdf

<b>Electrical and environmental requirements</b>	<ul style="list-style-type: none"><li>■ Line voltage: universal input (100V to 240V AC), power factor corrected</li><li>■ Maximum input current: 8.0A (100V to 120V) or 4.0A (200V to 240V); current is shared when system is configured with two power supplies</li><li>■ Frequency: 50Hz to 60Hz, single phase</li><li>■ Output power: 650W</li><li>■ Operating temperature: 50° to 95° F (10° to 35° C)</li><li>■ Storage temperature: -40° to 116° F (-40° to 47° C)</li><li>■ Relative humidity: 5% to 95% noncondensing</li><li>■ Maximum altitude: 10,000 feet</li><li>■ FCC Class A approved</li></ul>
<b>Size and weight</b>	<ul style="list-style-type: none"><li>■ 1.73 inches (4.4 cm) high by 17.6 inches (44.7 cm) wide by 30 inches (76.2 cm) deep</li><li>■ 31.7 pounds (14.4 kg) for base configuration; 38.3 pounds (17.4 kg) with three 300GB SAS Apple Drive Modules and two power supplies <sup>(3)</sup></li></ul>

1. For hard drive capacity measurements, 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
2. Maximum capacity of 2.25TB achieved through use of three 750GB Apple Drive Modules.
3. Weight varies by configuration and manufacturing process.

Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

# Centris 650: Technical Specifications

## Centris 650

Logic Board	Ports	Power
Processor: 601, 50	USB:	Max Watts: 230
PMMU: integrated	ADB: 2	Amps: 1.9
FPU: integrated	Video: DB-15	BTU per Hr: 786.6
Data Path: 64, 25	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 1MB	Geoports:	Battery Type: 3.6V lithium
2nd Processor: 68040, 50/25 MHz	Ethernet: opt. AAUI-15	Soft Power: yes
Slots: 3 NuBus, PDS filled	FireWire:	Pass Through: yes
Notes: This configuration is achieved by installing the Power Macintosh Upgrade Card.	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer, Modem, Speaker, ,	
Memory	Video Memory	
Logic Board: 4, 8 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 1MB VRAM (2x256K)
RAM Slots: 4, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 132, 136 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	8-bit 16-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 3/14/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 5/15/1995	Orig SSW: 7.1.2	Floppy Inject: auto
Form Factor: IIvx	Orig Enabler: PowerPC Upgrade Card Enabler	Min. Int HD Size: 80-500MB
Gestalt ID: 120	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: n/a	Orig CD Speed: 2x
Dimensions (in): 6 H x 13 W x 16.5 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.5, 7.1.2, 7.5.1, 7.5.3, 7.5.5, 7.6, 7.6.1, 8.0, 8.5, 8.1	

# Macintosh Performa 460:Technical Specifications

## Macintosh Performa 460

Logic Board	Ports	Power
Processor: 68030, 33	USB:	Max Watts: 50
PMMU: integrated	ADB: 1	Amps: .42
FPU: opt. 68882	Video: DB-15	BTU per Hr: 171
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	
Slots: 1 LC III PDS	FireWire:	
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 768K VRAM (1x256K)
RAM Slots: 1, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	16-bit 16-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
	Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.	
Physical	Software	Storage
Introduced: 10/18/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.1P3	Floppy Inject: auto
Form Factor: LC	Orig Enabler: System Enabler 308	Min. Int HD Size: 80-160MB
Gestalt ID: 62	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 8.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.9 H x 12.2 W x 15.3 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS 7.1P3	
	Supported: 7.1P5	
	7.1P6	
	7.5	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	



# Macintosh Quadra 650: Technical Specifications

## Macintosh Quadra 650

Logic Board	Ports	Power
Processor: 68040, 33	USB:	Max Watts: 230
PMMU: integrated	ADB: 2	Amps: 1.9
FPU: integrated	Video: DB-15	BTU per Hr: 786.6
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: 3 NuBus, 1 PDS	FireWire:	Pass Through: yes
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4, 8 MB	Resolution	Video Memory 512K VRAM (built in)
RAM Slots: 4, 72-pin SIMM		Video Memory 1MB VRAM (2x256K)
Min - Max RAM: 4 MB - 132, 136 M B	512 x 384	16-bit
Min RAM Speed: 80	640 x 400	n/a-bit
RAM Sizes: 4, 8, 16, 32 MB	640 x 480	8-bit
Install in Groups of: 1	800 x 600	8-bit
	832 x 624	8-bit
	1024 x 768	4-bit
	1152 x 870	4-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 10/21/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 9/12/1994	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: IIVx	Orig Enabler: System Enabler 040 v1.1	Min. Int HD Size: 230-500MB
Gestalt ID: 36	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 6 H x 13 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	

# Macintosh Centris 660AV: Technical Specifications

## Macintosh Centris 660AV

Logic Board		Ports		Power	
Processor:	68040, 25	USB:		Max Watts:	86
PMMU:	integrated	ADB: 1		Amps:	1.7
FPU:	integrated	Video: DB-15		BTU per Hr:	294.12
Data Path:	32, 25	Floppy: none		Voltage:	100-240
L1 Cache:	8K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	none	Geoports: 1		Battery Type:	3.6V lithium
2nd Processor:	AT&T 3210 DSP, 55 MHz	Ethernet: AAUI-15		Pass Through:	yes
Slots:	one 7♦ NuBus or PDS	FireWire:			
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
		Port Notes: Includes S-video and RCA ports for video in and out.			
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 1MB VRAM (built in)		
RAM Slots:	2, 72-pin SIMM	512 x 384	24-bit		
Min - Max RAM:	4 MB - 68 MB	640 x 400	24-bit		
Min RAM Speed:	70	640 x 480	16-bit		
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	16-bit		
Install in Groups of:	1	832 x 624	16-bit		
		1024 x 768	8-bit		
		1152 x 870	8-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	7/29/1993	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	10/1/1993	Orig SSW:	7.1	Floppy Inject:	auto
Form Factor:	Centris 610	Orig Enabler:	System Enabler 088 v1.0	Min. Int HD Size:	80-500MB
Gestalt ID:	60	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	14	ROM Ver:	\$10	Orig CD Speed	2x
Dimensions (in):	3.4 H x 16.3 W x 15.6 D	ROM Size:	2MB	Int CD Support:	yes
		AppleTalk Ver:	57.0.5		
		Mac OS Supported:	7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0		

# Macintosh Quadra 660AV: Technical Specifications

## Macintosh Quadra 660AV

Logic Board	Ports	Power
Processor: 68040, 25	USB:	Max Watts: 86
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: DB-15	BTU per Hr: 294.12
Data Path: 32, 25	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: none	Geoports: 1	Battery Type: 3.6V lithium
2nd Processor: AT&T 3210 DSP, 55 MHz	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7♦ NuBus or PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
	Port Notes: Includes S-video and RCA ports for video in and out.	
Memory	Video Memory	
Logic Board: 4 MB	Resolution Video Memory	
RAM Slots: 2, 72-pin SIMM	1MB VRAM (built in)	
Min - Max RAM: 4 MB - 68 MB	512 x 384	24-bit
Min RAM Speed: 70	640 x 400	24-bit
RAM Sizes: 4, 8, 16, 32 MB	640 x 480	16-bit
Install in Groups of: 1	800 x 600	16-bit
	832 x 624	16-bit
	1024 x 768	8-bit
	1152 x 870	8-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 10/1/1993	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 9/12/1994	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: Centris 610	Orig Enabler: System Enabler 088 v1.1	Min. Int HD Size: 80-500MB
Gestalt ID: 60	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$10	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 2MB	Int CD Support: yes
	AppleTalk Ver: 57.0.5	
	Mac OS Supported: 7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	

# Macintosh Quadra 700: Technical Specifications

## Macintosh Quadra 700

Logic Board		Ports		Power	
Processor:	68040, 25	USB:		Max Watts:	50
PMMU:	integrated	ADB:		Amps:	1.9
FPU:	integrated	Video:		BTU per Hr:	171
Data Path:	32, 25	Floppy:		Voltage:	100-240
L1 Cache:	8K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:		Soft Power:	yes
Slots:	2 NuBus, 1 PDS	FireWire:		Pass Through:	yes
		Mic Type:			
		AirPort Ready:			
		Other Ports:			
		Printer			
		Modem			
		Speaker			
		,			
Memory		Video Memory			
Logic Board:	4 MB				
RAM Slots:	4, 30-pin SIMM				
Min - Max RAM:	4 MB - 20 MB				
Min RAM Speed:	80				
RAM Sizes:	1, 4 MB				
Install in Groups of:	4				

# Macintosh Quadra 800: Technical Specifications

## Macintosh Quadra 800

Logic Board	Ports	Power
Processor: 68040, 33	USB:	Max Watts: 200
PMMU: integrated	ADB: 2	Amps: 9
FPU: integrated	Video: DB-15	BTU per Hr: 684
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: 3 NuBus, 1 PDS	FireWire:	Pass Through: yes
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 512K VRAM (built in)
RAM Slots: 4, 72-pin SIMM		Video Memory 1MB VRAM (2x256K)
Min - Max RAM: 8 MB - 136MB	512 x 384	16-bit
Min RAM Speed: 60	640 x 400	n/a-bit
RAM Sizes: 4, 8, 16, 32 MB	640 x 480	8-bit
Install in Groups of: 1	800 x 600	8-bit
	832 x 624	8-bit
	1024 x 768	4-bit
	1152 x 870	4-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 2/10/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 3/14/1994	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: Quadra 800	Orig Enabler: System Enabler 040 v1.0	Min. Int HD Size: 230MB-1GB
Gestalt ID: 35	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 24	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 14 H x 7.7 W x 15.75 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1	

# Macintosh Quadra 840AV: Technical Specifications

## Macintosh Quadra 840AV

Logic Board	Ports	Power																											
Processor: 68040, 40 PMMU: integrated FPU: integrated Data Path: 32, 40 L1 Cache: 8K L2 Cache: none 2nd Processor: AT&T 3210 DSP, 66.67 MHz Slots: 3 NuBus	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: 1 Ethernet: AAUI-15 FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker , Port Notes: Includes S-video and RCA ports for video in and out.	Max Watts: 200 Amps: 9 BTU per Hr: 684 Voltage: 100-240 Freq Range: 50-60 Hz Battery Type: 3.6V lithium Soft Power: yes Pass Through: yes																											
Memory	Video Memory																												
Logic Board: none RAM Slots: 4, 72-pin SIMM Min - Max RAM: 4 MB - 128 MB Min RAM Speed: 60 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	<table> <thead> <tr> <th>Resolution</th><th>Video Memory 1MB VRAM (built in)</th><th>Video Memory 2MB VRAM (4x256K)</th></tr> </thead> <tbody> <tr> <td>512 x 384</td><td>24-bit</td><td>24-bit</td></tr> <tr> <td>640 x 400</td><td>24-bit</td><td>24-bit</td></tr> <tr> <td>640 x 480</td><td>16-bit</td><td>24-bit</td></tr> <tr> <td>800 x 600</td><td>16-bit</td><td>24-bit</td></tr> <tr> <td>832 x 624</td><td>16-bit</td><td>24-bit</td></tr> <tr> <td>1024 x 768</td><td>8-bit</td><td>16-bit</td></tr> <tr> <td>1152 x 870</td><td>8-bit</td><td>16-bit</td></tr> <tr> <td>1280 x 1024</td><td>n/a-bit</td><td>n/a-bit</td></tr> </tbody> </table>		Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (4x256K)	512 x 384	24-bit	24-bit	640 x 400	24-bit	24-bit	640 x 480	16-bit	24-bit	800 x 600	16-bit	24-bit	832 x 624	16-bit	24-bit	1024 x 768	8-bit	16-bit	1152 x 870	8-bit	16-bit	1280 x 1024	n/a-bit	n/a-bit
Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (4x256K)																											
512 x 384	24-bit	24-bit																											
640 x 400	24-bit	24-bit																											
640 x 480	16-bit	24-bit																											
800 x 600	16-bit	24-bit																											
832 x 624	16-bit	24-bit																											
1024 x 768	8-bit	16-bit																											
1152 x 870	8-bit	16-bit																											
1280 x 1024	n/a-bit	n/a-bit																											
Physical	Software	Storage																											
Introduced: 7/29/1993 Discontinued: 7/18/1994 Form Factor: Quadra 800 Gestalt ID: 78 Weight (lbs): 25.3 Dimensions (in): 14 H x 7.7 W x 15.75 D	Addressing Modes: 32-bit Orig SSW: 7.1 Orig Enabler: System Enabler 088 v1.0 ROM ID: \$077D ROM Ver: n/a ROM Size: 2MB AppleTalk Ver: 57.0.5 Mac OS Supported: 7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1	Floppy Size: 1.44MB Floppy Inject: either Min. Int HD Size: 230MB-1GB Int HD Interface: SCSI Orig CD Speed: 2x Int CD Support: yes																											

# Macintosh Quadra 900: Technical Specifications

## Macintosh Quadra 900

Logic Board		Ports		Power	
Processor:	68040, 25	USB:		Max Watts:	303
PMMU:	integrated	ADB:	1	Amps:	10
FPU:	integrated	Video:	DB-15	BTU per Hr:	1036.26
Data Path:	32, 25	Floppy:	none	Voltage:	100-240
L1 Cache:	8K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	AAUI-15	Soft Power:	yes
Slots:	5 NuBus, 1 PDS	FireWire:		Pass Through:	yes
		Mic Type:	Omni		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (4x256K)	
RAM Slots:	16, 30-pin SIMM				
Min - Max RAM:	4 MB - 256 MB	512 x 384	24-bit	24-bit	
Min RAM Speed:	80	640 x 400	n/a-bit	n/a-bit	
RAM Sizes:	1, 4, 8, 16 MB	640 x 480	8-bit	24-bit	
Install in Groups of:	4	800 x 600	n/a-bit	n/a-bit	
Notes:	8MB & 16MB SIMMs may be used, but are not supported by Apple.	832 x 624	8-bit	24-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	8-bit	8-bit	
		1280 x 1024	n/a-bit	n/a-bit	
		Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.			
Physical		Software		Storage	
Introduced:	10/21/1991	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	5/18/1992	Orig SSW:	7.0.1	Floppy Inject:	auto
Form Factor:	Quadra 900	Orig Enabler:	none	Min. Int HD Size:	80-160MB
Gestalt ID:	20	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	36.8	ROM Ver:	n/a	Orig CD Speed	2x
Dimensions (in):	18.6 H x 8.9 W x 20.6 D	ROM Size:	1MB	Int CD Support:	yes
		AppleTalk Ver:	56.0.2		
		Mac OS Supported:	7.0.1 7.1 7.1.1 (Pro) 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1		

# Macintosh Performa 466:Technical Specifications

## Macintosh Performa 466

Logic Board	Ports	Power
Processor: 68030, 33	USB:	Max Watts: 50
PMMU: integrated	ADB: 1	Amps: .42
FPU: opt. 68882	Video: DB-15	BTU per Hr: 171
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	
Slots: 1 LC III PDS	FireWire:	
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 768K VRAM (1x256K)
RAM Slots: 1, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	16-bit 16-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
	Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.	
Physical	Software	Storage
Introduced: 10/18/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.1P3	Floppy Inject: auto
Form Factor: LC	Orig Enabler: System Enabler 308	Min. Int HD Size: 80-160MB
Gestalt ID: 62	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 8.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.9 H x 12.2 W x 15.3 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS 7.1P3	
	Supported: 7.1P5	
	7.1P6	
	7.5	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	



# MacBook (13-inch, Late 2006) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## MacBook (Late 2006) - Technical Specifications

	1.83GHz MacBook (MA699LL/A)	2.0GHz MacBook (MA700LL/A)	2.0GHz MacBook (MA701LL/A)
Color	White	White	Black
Processor	1.83GHz Intel Core 2 Duo	2.0GHz Intel Core 2 Duo	2.0GHz Intel Core 2 Duo
L2 cache	2MB shared	4MB shared	4MB shared
System bus	667MHz		
Memory	512MB (2x256MB) of 667MHz DDR2 SDRAM (PC2-5300); supports up to 2GB	1GB (2x512MB) of 667MHz DDR2 SDRAM (PC2-5300); supports up to 2GB	
Hard drive <sup>(1)</sup>	60GB Serial ATA; 5400-rpm	80GB Serial ATA; 5400-rpm	120GB Serial ATA; 5400-rpm
Slot-loading optical drive	Combo drive (DVD-ROM/CD-RW)	6x SuperDrive (DVD+R DL/DVD±RW/CD-RW)	
Graphics	Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory <sup>3</sup>		
Video	Built-in iSight camera; mini-DVI output port with support for DVI, VGA, S-video, and composite video (requires adapters, sold separately)		
Display	13.3-inch (diagonal) glossy TFT widescreen display, 1280 by 800 resolution		
FireWire	One FireWire 400 port (8 watts)		
USB	Two USB 2.0 ports (up to 480 Mbps)		
Audio	Built-in stereo speakers, built-in omnidirectional microphone, combined optical digital audio input/audio line in, combined optical digital audio output/headphone out		
Networking	Built-in 10/100/1000BASE-T (Gigabit)		
Wireless <sup>(4)</sup>	Built-in 54-Mbps AirPort Extreme wireless networking (802.11g standard; 802.11n capable with optional 802.11n enabler)		
Hardware accessories	Apple Remote, 60W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery		
Limited warranty and service	Your MacBook comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.		

### Configure to order

- 80GB (5400 rpm) hard drive
- 120GB (5400 rpm) hard drive
- 160GB (5400 rpm) hard drive
- 200GB (4200 rpm) hard drive
- Up to 2GB of 667MHz DDR2 SDRAM
- Apple USB Modem (MA034Z/A)
- Apple Mini-DVI to DVI Adapter (M9321G/B)
- Apple Mini-DVI to VGA Adapter (M9320G/A)
- Aperture (MA715Z/A)
- Final Cut Express (MA261Z/A)
- Logic Express (MA603Z/A)
- iWork '06 (MA222Z/A)

### Accessories

- AirPort Express Base Station (M9470LL/A)
- AirPort Extreme Base Station (M8799LL/A)
- MagSafe Airline Adapter (MA598Z/A)
- Apple 8x DVD-R Media Kit (M9472G/A)
- Apple mini-DVI to Video Adapter (M9319G/A)
- Apple FireWire Cable (M8706G/A)
- AppleCare Protection Plan (MA519LL/A)
- .Mac Subscription (MA361Z/A)
- Apple Wireless Keyboard (M9270LL/A)
- Apple Wireless Mighty Mouse (MA272LL/A)

# 23\_MacBook (13-inch, Late 2006) - Technical Specifications.pdf

## Technical Specifications

### In the box

- MacBook
- Apple Remote
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Lithium-polymer battery
- Install/restore DVDs
- Printed and electronic documentation

### Processor and memory

- 1.83GHz or 2.0GHz Intel Core 2 Duo processor
- 4MB shared L2 cache running at full processor speed on MacBook with 2.0GHz Intel Core 2 Duo processor
- 2MB shared L2 cache running at full processor speed on MacBook with 1.83GHz Intel Core 2 Duo processor
- 667MHz frontside bus
- 667MHz DDR2 SDRAM (PC2-5300; two SO-DIMM slots support up to 2GB
  - 1GB (two 512MB SO-DIMMs) in 2.0GHz models
  - 512MB (two 256MB SO-DIMMs) in 1.83GHz model

### Storage

- 60GB, 80GB, or 120GB 5400-rpm Serial ATA hard disk drive; optional 80GB, 120GB, or 160GB 5400-rpm; or 200GB 4200-rpm drive.<sup>(1)</sup>
- One of the following optical drives:
  - 24x slot-loading Combo drive (DVD-ROM/CD-RW)
    - Reads DVDs at up to 8x speed
    - Writes CD-R discs at up to 24x speed
    - Writes CD-RW discs at up to 16x speed
    - Reads CDs at up to 24x speed
  - 6x slot-loading SuperDrive (DVD+R DL/DVD±RW/CD-RW)
    - Writes DVD+R DL (double layer) discs at up to 2.4x speed
    - Writes DVD-R and DVD+R discs at up to 6x speed
    - Writes DVD-RW and DVD+RW discs at up to 4x speed
    - Reads DVDs at up to 8x speed
    - Writes CD-R discs at up to 24x speed
    - Writes CD-RW discs at up to 10x speed
    - Reads CDs at up to 24x speed

### Battery and power

- 55-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 6 hours of battery life<sup>(2)</sup>
- 60W MagSafe Power Adapter with cable management system
- MagSafe power adapter port

### Display

- 13.3-inch (diagonal) glossy widescreen. TFT display with support for millions of colors
- Supported resolutions: 1280 by 800 (native), 1152 by 720, 1024 by 768, 1024 by 640, 800 by 600, 800 by 500, 720 by 480, and 640 by 480 at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 at 3:2 aspect ratio

### Graphics and video support

- Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory<sup>(3)</sup>
- Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 1920 by 1200 pixels on an external display, both at millions of colors
- Built-in iSight camera
- Mini-DVI port
- DVI output using mini-DVI to DVI adapter (sold separately)
- VGA output using mini-DVI to VGA adapter (sold separately)
- Composite and S-video output using mini-DVI to video adapter (sold separately)

### Communications

- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard)
- Built-in Bluetooth 2.0 + Enhanced Data Rate (EDR)
- Optional external Apple USB Modem

### Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)

### Peripheral connections

- One FireWire 400 port (up to 400 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)

# 23\_MacBook (13-inch, Late 2006) - Technical Specifications.pdf

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and weight

- Height: 1.08 inches (2.75 cm)
- Width: 12.78 inches (32.5 cm)
- Depth: 8.92 inches (22.7 cm)
- Weight: 5.2 pounds (2.36 kg)

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork (30-day trial), Big Bang Board Games, Comic Life, OmniOutliner, and Apple Hardware Test
- Front Row

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded numeric keypad
- Solid-state scrolling trackpad for precise cursor control; supports two-finger scrolling, tap, double-tap, and drag capabilities
- Apple Remote

## Security

- Kensington cable lock slot

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Battery life depends on configuration and use.
3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 80MB, resulting in 432MB of system memory available on 1.83GHz models and 944MB of system memory available on 2.0GHz models.
4. Wireless Internet access requires AirPort Express or AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.

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Internet access requires a compatible Internet service provider; fees may apply.

Product contains electronic documentation.

Backup copy of software is included.

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# Macintosh Quadra 950: Technical Specifications

## Macintosh Quadra 950

Logic Board		Ports		Power	
Processor:	68040, 33	USB:		Max Watts:	303
PMMU:	integrated	ADB:		Amps:	10
FPU:	integrated	Video:		BTU per Hr:	1036.26
Data Path:	32, 33	Floppy:		Voltage:	100-240
L1 Cache:	8K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:		Soft Power:	yes
Slots:	5 NuBus, 1 PDS	FireWire:		Pass Through:	yes
		Mic Type:			
		AirPort Ready:			
		Other Ports:			
		Printer Modem Speaker ,			
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (4x256K)	
RAM Slots:	16, 30-pin SIMM	512 x 384	16-bit	24-bit	
Min - Max RAM:	4 MB - 256 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	80	640 x 480	16-bit	24-bit	
RAM Sizes:	1, 4, 8, 16 MB	800 x 600	n/a-bit	n/a-bit	
Install in Groups of:	4	832 x 624	16-bit	24-bit	
Notes:	8MB & 16MB SIMMs may be used, but are not supported by Apple.	1024 x 768	8-bit	16-bit	
		1152 x 870	8-bit	16-bit	
		1280 x 1024	n/a-bit	n/a-bit	
		Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.			
Physical		Software		Storage	
Introduced:	5/18/1992	Addressing Modes:		Floppy Size:	1.44MB
Discontinued:	10/14/1995	Orig SSW:		Floppy Inject:	auto
Form Factor:	Quadra 900	Orig Enabler:		Min. Int HD Size:	230MB-1GB
Gestalt ID:	26	ROM ID:		Int HD Interface:	SCSI
Weight (lbs):	36.8	ROM Ver:		Orig CD Speed	2x
Dimensions (in):	18.6 H x 8.9 W x 20.6 D	ROM Size:		Int CD Support:	yes
		AppleTalk Ver:			
		Mac OS Supported:			
		7.0.1			
		7.1			
		7.1.1 (Pro)			
		7.5			
		7.5.1			
		7.5.3			
		7.5.5			
		7.6			
		7.6.1			
		8.0			
		8.1			

# Macintosh Performa 467: Technical Specifications

## Macintosh Performa 467

Logic Board		Ports	Power
Processor:	68030, 33	USB:	Max Watts: 50
PMMU:	integrated	ADB:	Amps: .42
FPU:	opt. 68882	Video:	BTU per Hr: 171
Data Path:	32, 33	Floppy:	Voltage: 100-240
L1 Cache:	0.5K	SCSI:	Freq Range: 47-63 Hz
L2 Cache:	none	Geoports:	Battery Type: 3.6V lithium
2nd Processor:	none	Ethernet:	
Slots:	1 LC III PDS	FireWire:	
		Mic Type:	Omni
		AirPort Ready:	
		Other Ports:	Printer Modem Speaker ,
Memory		Video Memory	
Logic Board:	4 MB	Resolution	Video Memory 512K VRAM (built in)
RAM Slots:	1, 72-pin SIMM		Video Memory 768K VRAM (1x256K)
Min - Max RAM:	4 MB - 36 MB	512 x 384	16-bit
Min RAM Speed:	80	640 x 400	16-bit
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	640 x 480	8-bit
Install in Groups of:	1	800 x 600	n/a-bit
		832 x 624	8-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
		Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.	
Physical		Software	Storage
Introduced:	10/18/1993	Addressing Modes:	Floppy Size: 1.44MB
Discontinued:	n/a	Orig SSW:	Floppy Inject: auto
Form Factor:	LC	Orig Enabler:	Min. Int HD Size: 80-160MB
Gestalt ID:	62	ROM ID:	Int HD Interface: SCSI
Weight (lbs):	8.8	ROM Ver:	Orig CD Speed: n/a
Dimensions (in):	2.9 H x 12.2 W x 15.3 D	ROM Size:	Int CD Support:
		AppleTalk Ver:	
		Mac OS	
		Supported:	
		7.1P3	
		7.1P5	
		7.1P6	
		7.5	
		7.5.1	
		7.5.3	
		7.5.5	
		7.6	
		7.6.1	

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# Macintosh LC 475/605: Technical Specifications

## Macintosh LC 475/605

Logic Board	Ports	Power
Processor: 601, 50	USB:	Max Watts: 30
PMMU: integrated	ADB: 1	Amps: .25
FPU: integrated	Video: DB-15	BTU per Hr: 102.6
Data Path: 64, 25	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 256K	Geoports:	Battery Type: 3.6V lithium
2nd Processor: 68LC040, 50 MHz	Ethernet: none	
Slots: LC PDS (unavailable)	FireWire:	
Notes: This configuration is achieved by installing the Macintosh Processor Upgrade Card.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K) Video Memory 1MB VRAM (2x512K)
RAM Slots: 1, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 11/3/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 3/2/1996	Orig SSW: 7.5	Floppy Inject: manual
Form Factor: LC	Orig Enabler: 601 Processor Upgrade Enabler	Min. Int HD 80-Size: 250MB
Gestalt ID: 104	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 8.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.9 H x 12.2 W x 15.3 D	ROM Size: 4MB	Int CD Support:
	AppleTalk Ver: n/a	
	Mac OS Supported: 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1	

# Macintosh LC 575: Technical Specifications

## Macintosh LC 575

Logic Board	Ports	Power
Processor: 601, 66	USB:	Max Watts: 60
PMMU: integrated	ADB: 1	Amps: .5
FPU: integrated	Video: none	BTU per Hr: 205.2
Data Path: 64, 33	Floppy: none	Voltage: 90-264
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 256K	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: 68LC040, 66 MHz	Ethernet: none	Soft Power: yes
Slots: LC (unavail.), comm	FireWire:	
Notes: This configuration is achieved by installing the Macintosh Processor Upgrade Card.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K) Video Memory 1MB VRAM (2x512K)
RAM Slots: 1, 72-pin SIMM	512 x 384	n/a-bit n/a-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit n/a-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 11/3/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 3/2/1996	Orig SSW: 7.5	Floppy Inject: manual
Form Factor: LC 520	Orig Enabler: 601 Processor Upgrade Enabler	Min. Int HD Size: 160-320MB
Gestalt ID: 105	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 40.5	ROM Ver: n/a	Orig CD Speed: 2x
Dimensions (in): 17.9 H x 13.5 W x 16.5 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS Supported: 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1	

# Macintosh Performa 475: Technical Specifications

## Macintosh Performa 475

Logic Board	Ports	Power
Processor: 68LC040, 50	USB:	Max Watts: 50
PMMU: integrated	ADB: 1	Amps: .25
FPU: none	Video: DB-15	BTU per Hr: 171
Data Path: 32, 25	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	
Slots: 1 LC PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K) Video Memory 1MB VRAM (2x512K)
RAM Slots: 1, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 10/18/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.1P3	Floppy Inject: manual
Form Factor: LC	Orig Enabler: System Enabler 364	Min. Int HD Size: 160-230MB
Gestalt ID: 89	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 8.8	ROM Ver: n/a	Orig CD Speed n/a
Dimensions (in): 2.9 H x 12.2 W x 15.3 D	ROM Size: 1MB	Int CD Support:
	AppleTalk Ver: 57.0.4	
	Mac OS 7.1P3	
	Supported: 7.1P5	
	7.1P6	
	7.5	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	
	8.1	

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# Macintosh LC 580: Technical Specifications

## Macintosh LC 580

Logic Board	Ports	Power
Processor: 601, 66	USB:	Max Watts: 60
PMMU: integrated	ADB: 1	Amps: .5
FPU: integrated	Video: opt. DB-15	BTU per Hr: 205.2
Data Path: 64, 33	Floppy: none	Voltage: 90-264
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 256K	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: 68LC040, 66 MHz	Ethernet: none	Soft Power: yes
Slots: Comm, video in/out	FireWire:	
Notes: This configuration is achieved by installing the Macintosh Processor Upgrade Card.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	n/a-bit
Min - Max RAM: 4 MB - 52 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
Notes: Second SIMM slot can accept only 1, 4, or 16MB SIMMs.	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 4/3/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 3/2/1996	Orig SSW: 7.5	Floppy Inject: manual
Form Factor: LC 520	Orig Enabler: 601 Processor Upgrade Enabler	Min. Int HD Size: 500MB
Gestalt ID: 107	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 40.5	ROM Ver: \$24	Orig CD Speed: 2x
Dimensions (in): 17.9 H x 13.5 W x 16.5 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.1.3	
	Mac OS Supported: 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1	

# Macintosh Performa 476: Technical Specifications

Macintosh Performa 476

Logic Board	Ports	Power																											
Processor: 68LC040, 50 PMMU: integrated FPU: none Data Path: 32, 25 L1 Cache: 8K L2 Cache: none 2nd Processor: none Slots: 1 LC PDS	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,	Max Watts: 50 Amps: .25 BTU per Hr: 171 Voltage: 100-240 Freq Range: 47-63 Hz Battery Type: 3.6V lithium																											
Memory	Video Memory																												
Logic Board: 4 MB RAM Slots: 1, 72-pin SIMM Min - Max RAM: 4 MB - 36 MB Min RAM Speed: 80 RAM Sizes: 1, 2, 4, 8, 16, 32 MB Install in Groups of: 1	<table> <thead> <tr> <th>Resolution</th><th>Video Memory 512K VRAM (2x256K )</th><th>Video Memory 1MB VRAM (2x512K)</th></tr> </thead> <tbody> <tr> <td>512 x 384</td><td>16-bit</td><td>16-bit</td></tr> <tr> <td>640 x 400</td><td>n/a-bit</td><td>n/a-bit</td></tr> <tr> <td>640 x 480</td><td>8-bit</td><td>16-bit</td></tr> <tr> <td>800 x 600</td><td>n/a-bit</td><td>n/a-bit</td></tr> <tr> <td>832 x 624</td><td>8-bit</td><td>16-bit</td></tr> <tr> <td>1024 x 768</td><td>4-bit</td><td>8-bit</td></tr> <tr> <td>1152 x 870</td><td>4-bit</td><td>8-bit</td></tr> <tr> <td>1280 x 1024</td><td>n/a-bit</td><td>n/a-bit</td></tr> </tbody> </table>	Resolution	Video Memory 512K VRAM (2x256K )	Video Memory 1MB VRAM (2x512K)	512 x 384	16-bit	16-bit	640 x 400	n/a-bit	n/a-bit	640 x 480	8-bit	16-bit	800 x 600	n/a-bit	n/a-bit	832 x 624	8-bit	16-bit	1024 x 768	4-bit	8-bit	1152 x 870	4-bit	8-bit	1280 x 1024	n/a-bit	n/a-bit	
Resolution	Video Memory 512K VRAM (2x256K )	Video Memory 1MB VRAM (2x512K)																											
512 x 384	16-bit	16-bit																											
640 x 400	n/a-bit	n/a-bit																											
640 x 480	8-bit	16-bit																											
800 x 600	n/a-bit	n/a-bit																											
832 x 624	8-bit	16-bit																											
1024 x 768	4-bit	8-bit																											
1152 x 870	4-bit	8-bit																											
1280 x 1024	n/a-bit	n/a-bit																											
Physical	Software	Storage																											
Introduced: 10/18/1993 Discontinued: n/a Form Factor: LC Gestalt ID: 89 Weight (lbs): 8.8 Dimensions (in): 2.9 H x 12.2 W x 15.3 D	Addressing Modes: 24-, 32-bit Orig SSW: 7.1P3 Orig Enabler: System Enabler 364 ROM ID: \$067C ROM Ver: n/a ROM Size: 1MB AppleTalk Ver: 57.0.4 Mac OS Supported: 7.1P3 7.1P5 7.1P6 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 160-230MB Int HD Interface: SCSI Orig CD Speed n/a Int CD Support:																											

Published Date: Jul 25, 2017

# Macintosh LC 630: Technical Specifications

## Macintosh LC 630

Logic Board	Ports	Power
Processor: 601, 66	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.25
FPU: integrated	Video: DB-15	BTU per Hr: 153.9
Data Path: 64, 33	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: 68LC040/68040, 66 MHz	Ethernet: none	Soft Power: yes
Slots: Comm, TV, video in	FireWire:	
Notes: This configuration is achieved by installing the Macintosh Processor Upgrade Card.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 1, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	8-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 11/3/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 3/2/1996	Orig SSW: 7.5	Floppy Inject: manual
Form Factor: Quadra 630	Orig Enabler: 601 Processor Upgrade Enabler	Min. Int HD Size: 250-350MB
Gestalt ID: 106	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 19	ROM Ver: n/a	Orig CD Speed: 2x
Dimensions (in): 4.3 H x 12.6 W x 16.5 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS Supported: 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1	

# Quadra 610: Technical Specifications

## Quadra 610

Logic Board	Ports	Power
Processor: 601, 50	USB:	Max Watts: 210
PMMU: integrated	ADB: 2	Amps: 1.7
FPU: integrated	Video: DB-15	BTU per Hr: 718.2
Data Path: 64, 25	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 1MB	Geoports:	Battery Type: 3.6V lithium
2nd Processor: 68040, 50/25 MHz	Ethernet: AAUI-15	Pass Through: yes
Slots: PDS filled	FireWire:	
Notes: This configuration is achieved by installing the Power Macintosh Upgrade Card.	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 1MB VRAM (2x256K)
RAM Slots: 2, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 68 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	8-bit 16-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 3/14/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 5/15/1995	Orig SSW: 7.1.2	Floppy Inject: auto
Form Factor: Centris 610	Orig Enabler: PowerPC Upgrade Card Enabler	Min. Int HD Size: 160-230MB
Gestalt ID: 121	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: n/a	Orig CD Speed: 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.5 7.1.2 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1	

# MacBook Pro (Late 2006) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Configurations

	15.4-inch: 2.16GHz(MA609LL)	15.4-inch: 2.33GHz(MA610LL)	17-inch: 2.33GHz(MA611LL/A)
<b>Display</b>	15.4-inch (diagonal), 1440 x 900 resolution, TFT widescreen		17-inch (diagonal), 1680 x 1050 resolution, TFT widescreen
<b>Processor</b>	2.16GHz Intel Core 2 Duo	2.33GHz Intel Core 2 Duo	2.33GHz Intel Core 2 Duo
<b>Memory</b>	1GB (single SO-DIMM) 667MHz DDR2 SDRAM (PC2-5300)		2GB (two SO-DIMMs) 667MHz DDR2 SDRAM (PC2-5300)
<b>PCI Express graphics</b>	ATI Mobility Radeon X1600 with 128MB of GDDR3 SDRAM and dual-link DVI		ATI Mobility Radeon X1600 with 256MB of GDDR3 SDRAM and dual-link DVI
<b>Hard disk drive</b> <sup>1</sup>	120GB Serial ATA; 5400 rpm		160GB Serial ATA; 5400 rpm
<b>Slot-loading optical drive</b>	6x SuperDrive (DVD+R DL/DVD±RW/CD-RW)		8x SuperDrive (DVD+R DL/DVD±RW/CD-RW)
<b>Expansion</b>	One FireWire 400, one FireWire 800, two USB 2.0 ports, and ExpressCard/34 slot		One FireWire 400, one FireWire 800, three USB 2.0 ports, and ExpressCard/34 slot
<b>Video</b>	Built-in iSight camera, DVI, VGA (DVI to VGA adapter included)		
<b>Audio</b>	Combined optical digital input/audio line in, combined optical digital output/headphone out, stereo speakers, microphone		
<b>Ethernet</b>	Built-in 10/100/1000BASE-T (Gigabit)		
<b>Wireless</b> <sup>2</sup>	Built-in 54-Mbps AirPort Extreme (802.11g; 802.11n capable with optional 802.11n enabler) <sup>2</sup> ; built-in Bluetooth 2.0+EDR		
<b>Modem</b>	Apple USB Modem (sold separately)		
<b>Input</b>	Apple Remote; full-size, illuminated keyboard with ambient light sensor; scrolling trackpad		
<b>Weight</b> <sup>4</sup>	5.6 pounds		6.8 pounds
<b>Footprint</b>	14.1 x 9.6 inches		15.4 x 10.4 inches
<b>Thickness</b>	1.0 inch		
<b>Video accessories</b>	DVI to VGA adapter included (other adapters sold separately)		
<b>Hardware accessories</b>	85W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery <sup>4</sup>		
<b>Limited warranty and service</b>	Your MacBook Pro comes with 90 days of telephone support and a one-year limited warranty. For more information, visit Apple support or call 800-823-2775.		

## Options

- Apple Wireless Keyboard
- Apple USB Modem
- Apple Wireless Mighty Mouse
- Apple Keyboard
- AppleCare Protection Plan

## Online store options

- Up to 3GB main memory
- 100GB 7200-rpm, 160GB 5400-rpm, 200GB 4200-rpm hard drive<sup>1</sup>
- AirPort Extreme Base Station
- AirPort Express
- Apple DVI to Video Adapter
- Apple 85W MagSafe Power Adapter
- MagSafe Airline Adapter
- Rechargeable Battery, 15-inch MacBook Pro
- Rechargeable Battery, 17-inch MacBook Pro
- World Travel Adapter Kit

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- iWork

## Processor and memory

- 15-inch MacBook Pro
  - 2.16GHz or 2.33GHz Intel Core 2 Duo processor, 4MB on-chip shared L2 cache running 1:1 with processor speed
  - 1GB (single SO-DIMM) of PC2-5300 (667MHz) DDR2 memory on 2.16GHz configuration; and 2GB (two SO-DIMMs) on 2.33GHz configuration; two SO-DIMM slots support up to 3GB
  - 667MHz frontside bus
- 17-inch MacBook Pro
  - 2.33GHz Intel Core 2 Duo processor, 4MB on-chip shared L2 cache running 1:1 with processor speed
  - 2GB (two SO-DIMMs) of PC2-5300 (667MHz) DDR2 memory; two SO-DIMM slots support up to 3GB
  - 667MHz frontside bus

## Display

- 15-inch MacBook Pro
  - 15.4-inch (diagonal) TFT display, support for millions of colors; optional glossy widescreen display
  - Supported resolutions: 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio, 720 by 480 at 3:2 aspect ratio stretched
- 17-inch MacBook Pro
  - 17-inch (diagonal) TFT display, support for millions of colors; optional glossy widescreen display
  - Supported resolutions: 1680 by 1050 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1280 by 1024 at 5:4 aspect ratio; 1280 by 1024 at 5:4 aspect ratio stretched; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio; 720 by 480 at 3:2 aspect ratio stretched

## Video and graphics support

- 15-inch MacBook Pro
  - ATI Mobility Radeon X1600 graphics processor, dual-link DVI support, 128MB of GDDR3 SDRAM on 2.16GHz configuration; 256MB of GDDR3 SDRAM on 2.33GHz configuration
- 17-inch MacBook Pro
  - ATI Mobility Radeon X1600 graphics processor, dual-link DVI support, 256MB of GDDR3 SDRAM.
- iSight
  - Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
  - DVI output port
  - VGA output using included DVI to VGA adapter
  - Built-in iSight camera

## Storage<sup>1</sup>

- 15-inch MacBook Pro
  - 120GB 5400-rpm Serial ATA hard drive. Optional 160GB 5400-rpm, 200GB 4200-rpm drives<sup>3</sup>.
  - 6x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
    - Maximum write: 6x DVD-R and DVD+R; 4x DVD+RW and DVD-RW; 2.4x DVD+R DL (double layer); 24x CD-R; 10x CD-RW
    - Maximum read: 8x DVD-ROM, DVD-R, DVD+R; 6x DVD-ROM (double layer DVD-9), DVD+RW, DVD-RW; 4x DVD+R DL (double layer); 24x CD
- 17-inch MacBook Pro
  - 160GB 5400-rpm Serial ATA hard drive. Optional 100GB 7200-rpm, 200GB 4200-rpm drives<sup>3</sup>.
  - 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
    - Maximum write: 8x DVD-R, DVD+R, and DVD+RW; 6x DVD-RW; 4x DVD+R DL (double layer), 24x CD-R; 16x CD-RW
    - Maximum read: 8x DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R, DVD-RW, DVD+R and DVD+RW, DVD+R DL (double layer); 24x CD

## Communications

- Built-in 54-Mbps AirPort Extreme wireless networking (802.11g standard; 802.11n capable with optional 802.11n enabler)<sup>2</sup>
- Built-in Bluetooth 2.0+EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

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## Audio

- Combined optical digital input/audio line in (minijack)
- Combined optical digital output/headphone out (minijack)
- Built-in stereo speakers
- Internal omnidirectional microphone (located under left speaker grille)

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement), and embedded numeric keypad
  - Backlit keyboard with ambient light sensors for automatic adjustment of keyboard illumination and screen brightness

## Expansion

- One FireWire 400 port at up to 400 Mbps
- One FireWire 800 port at up to 800 Mbps
- 15-inch MacBook Pro
  - Two 480-Mbps USB 2.0 ports
- 17-inch MacBook Pro
  - Three 480-Mbps USB 2.0 ports
- ExpressCard/34 slot

## Security

- Kensington cable lock slot

## Battery and power<sup>3</sup>

- 15-inch MacBook Pro
  - 60-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 5 hours of battery life
- Battery17-inch MacBook Pro
  - 68-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 5.5 hours of battery life
- 85W MagSafe Power Adapter with cable management system
- MagSafe power adapter port

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork '06 (30-day trial), Comic Life, FileMaker Pro Trial, OmniOutliner
- Photo Booth
- Front Row

## In the box

- MacBook Pro
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Lithium-polymer battery
- Apple Remote
- DVI to VGA adapter
- Install/restore DVDs
- Printed and electronic documentation

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Wireless Internet access requires base station or other wireless access point and Internet access (fees may apply). Achieving data rates up to 54 Mbps or more requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme or AirPort Express Base Station. Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.
  3. Battery life depends on configuration and use.
  4. Actual weight varies by configuration and manufacturing process.

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Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. Product specifications are subject to change without notice.

Published Date: Apr 6, 2016



# Quadra 650: Technical Specifications

## Quadra 650

Logic Board	Ports	Power
Processor: 601, 66	USB:	Max Watts: 230
PMMU: integrated	ADB: 2	Amps: 1.9
FPU: integrated	Video: DB-15	BTU per Hr: 786.6
Data Path: 64, 33	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 1MB	Geoports:	Battery Type: 3.6V lithium
2nd Processor: 68040, 66/33 MHz	Ethernet: AAUI-15	Soft Power: yes
Slots: 3 NuBus, PDS filled	FireWire:	Pass Through: yes
Notes: This configuration is achieved by installing the Power Macintosh Upgrade Card.	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4, 8 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 1MB VRAM (2x256K)
RAM Slots: 4, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 4 MB - 132, 136 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	8-bit 16-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 3/14/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 5/15/1995	Orig SSW: 7.1.2	Floppy Inject: auto
Form Factor: IIVx	Orig Enabler: PowerPC Upgrade Card Enabler	Min. Int HD Size: 230-500MB
Gestalt ID: 122	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: n/a	Orig CD Speed: 2x
Dimensions (in): 6 H x 13 W x 16.5 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.5 7.1.2 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1	

# Quadra 700: Technical Specifications

## Quadra 700

Logic Board	Ports	Power	
Processor: 601, 50	USB:	Max Watts: 50	
PMMU: integrated	ADB: 2	Amps: 1.9	
FPU: integrated	Video: DB-15	BTU per Hr: 171	
Data Path: 64, 25	Floppy: none	Voltage: 100-240	
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz	
L2 Cache: 1MB	Geoports:	Battery Type: 3.6V lithium	
2nd Processor: 68040, 50/25 MHz	Ethernet: AAUI-15	Soft Power: yes	
Slots: 2 NuBus, PDS filled	FireWire:	Pass Through: yes	
Notes: This configuration is achieved by installing the Power Macintosh Upgrade Card.	Mic Type: Omni		
	AirPort Ready:		
	Other Ports: Printer Modem Speaker ,		
Memory	Video Memory		
Logic Board: 4 MB	Video Memory		
RAM Slots: 4, 30-pin SIMM	Resolution	512K VRAM	Video Memory 1MB VRAM (2x256K)
Min - Max RAM: 4 MB - 20 MB			Video Memory 2MB VRAM (6x256K)
Min RAM Speed: 80		(built in)	
RAM Sizes: 1, 4 MB	512 x 384	8-bit	24-bit
Install in Groups of: 4	640 x 400	n/a-bit	n/a-bit
	640 x 480	8-bit	24-bit
	800 x 600	n/a-bit	n/a-bit
	832 x 624	8-bit	24-bit
	1024 x 768	n/a-bit	n/a-bit
	1152 x 870	4-bit	8-bit
	1280 x 1024	n/a-bit	n/a-bit
	Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.		
Physical	Software	Storage	

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Introduced:	3/14/1994	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	5/15/1995	Orig SSW:	7.1.2	Floppy Inject:	auto
Form Factor:	IIcx	Orig Enabler:	PowerPC Upgrade Card Enabler	Min. Int HD Size:	80-400MB
Gestalt ID:	116	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	13.6	ROM Ver:	n/a	Orig CD Speed	n/a
Dimensions (in):	5.5 H x 11.9 W x 14.4 D	ROM Size:	4MB	Int CD Support:	
		AppleTalk Ver:	58.0.2		
		Mac OS Supported:	7.5 7.1.2 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1		

Published Date: Jul 26, 2017

# Quadra 800: Technical Specifications

## Quadra 800

Logic Board	Ports	Power
Processor: 601, 66	USB:	Max Watts: 200
PMMU: integrated	ADB: 1	Amps: 9
FPU: integrated	Video: DB-15	BTU per Hr: 684
Data Path: 64, 33	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 1MB	Geoports:	Battery Type: 3.6V lithium
2nd Processor: 68040, 66/33 MHz	Ethernet: AAUI-15	Soft Power: yes
Slots: 3 NuBus, PDS filled	FireWire:	Pass Through: yes
Notes: This configuration is achieved by installing the Power Macintosh Upgrade Card.	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 1MB VRAM (2x256K)
RAM Slots: 4, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 8 MB - 136 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 60	640 x 480	8-bit 16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	8-bit 16-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 3/14/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 5/15/1995	Orig SSW: 7.1.2	Floppy Inject: auto
Form Factor: Quadra 800	Orig Enabler: PowerPC Upgrade Card Enabler	Min. Int HD Size: 230MB-1GB
Gestalt ID: 123	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 24	ROM Ver: n/a	Orig CD Speed: 2x
Dimensions (in): 14 H x 7.7 W x 15.75 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.5 7.1.2 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1	

# Quadra 900: Technical Specifications

## Quadra 900

Logic Board	Ports	Power
Processor: 601, 50	USB:	Max Watts: 303
PMMU: integrated	ADB: 1	Amps: 10
FPU: integrated	Video: DB-15	BTU per Hr: 1036.26
Data Path: 64, 25	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 1MB	Geoports:	Battery Type: 3.6V lithium
2nd Processor: 68040, 50/25 MHz	Ethernet: AAUI-15	Soft Power: yes
Slots: 5 NuBus, PDS filled	FireWire:	Pass Through: yes
Notes: This configuration is achieved by installing the Power Macintosh Upgrade Card.	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 1MB VRAM (built in) Video Memory 2MB VRAM (4x256K)
RAM Slots: 16, 30-pin SIMM	512 x 384	24-bit 24-bit
Min - Max RAM: 4 MB - 256 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 24-bit
RAM Sizes: 1, 4, 8, 16 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 4	832 x 624	8-bit 24-bit
Notes: 8MB & 16MB SIMMs may be used, but are not supported by Apple.	1024 x 768	n/a-bit n/a-bit
	1152 x 870	8-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
	Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.	
Physical	Software	Storage
Introduced: 3/14/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 5/15/1995	Orig SSW: 7.1.2	Floppy Inject: auto
Form Factor: Quadra 900	Orig Enabler: PowerPC Upgrade Card Enabler	Min. Int HD Size: 80-160MB
Gestalt ID: 117	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 36.8	ROM Ver: n/a	Orig CD Speed: 2x
Dimensions (in): 18.6 H x 8.9 W x 20.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.5 7.1.2 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1	

# Quadra 950: Technical Specifications

## Quadra 950

Logic Board	Ports	Power
Processor: 601, 66	USB:	Max Watts: 303
PMMU: integrated	ADB: 1	Amps: 10
FPU: integrated	Video: DB-15	BTU per Hr: 1036.26
Data Path: 64, 33	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 1MB	Geoports:	Battery Type: 3.6V lithium
2nd Processor: 68040, 66/33 MHz	Ethernet: AAUI-15	Soft Power: yes
Slots: 5 NuBus, PDS filled	FireWire:	Pass Through: yes
Notes: This configuration is achieved by installing the Power Macintosh Upgrade Card.	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 1MB VRAM (built in)Video Memory 2MB VRAM (4x256K)
RAM Slots: 16, 30-pin SIMM	512 x 384	16-bit24-bit
Min - Max RAM: 4 MB - 256 MB	640 x 400	n/a-bitn/a-bit
Min RAM Speed: 80	640 x 480	16-bit24-bit
RAM Sizes: 1, 4, 8, 16 MB	800 x 600	n/a-bitn/a-bit
Install in Groups of: 4	832 x 624	16-bit24-bit
Notes: 8MB & 16MB SIMMs may be used, but are not supported by Apple.	1024 x 768	8-bit16-bit
	1152 x 870	8-bit16-bit
	1280 x 1024	n/a-bitn/a-bit
	Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.	
Physical	Software	Storage
Introduced: 3/14/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 5/15/1995	Orig SSW: 7.1.2	Floppy Inject: auto
Form Factor: Quadra 900	Orig Enabler: PowerPC Upgrade Card Enabler	Min. Int HD Size: 230MB-1GB
Gestalt ID: 118	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 36.8	ROM Ver: n/a	Orig CD Speed: 2x
Dimensions (in): 18.6 H x 8.9 W x 20.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.57.1.27.5.17.5.37.5.57.67.6.18.08.58.1	



# Network Server 700/150: Technical Specifications

## Network Server 700/150

Logic Board		Ports		Power																			
Processor:	604, 150	USB:		Max Watts:	425																		
PMMU:	integrated	ADB: 1		Amps:	7																		
FPU:	integrated	Video: HDI-15		BTU per Hr:	1453.5																		
Data Path:	64, 50	Floppy: none		Voltage:	100-240																		
L1 Cache:	32K	SCSI: DB-25		Freq Range:	50-60 Hz																		
L2 Cache:	1MB	Geoports:		Battery Type:	3.6V lithium																		
2nd Processor:	none	Ethernet: AAUI-15		Soft Power:	yes																		
Slots:	6 PCI	FireWire:		Notes:	Supports optional redundant hot-pluggable power supplies.																		
		Mic Type: PlainTalk																					
		AirPort Ready:																					
		Other Ports: Printer Modem Speaker ,																					
		Port Notes: This system has two serial ports. However, they are not labelled "Printer" and "Modem".																					
Memory		Video Memory																					
Logic Board:	none	<table><thead><tr><th>Resolution</th><th>Video Memory 1MB DRAM (built in)</th></tr></thead><tbody><tr><td>512 x 384</td><td>n/a-bit</td></tr><tr><td>640 x 400</td><td>n/a-bit</td></tr><tr><td>640 x 480</td><td>8-bit</td></tr><tr><td>800 x 600</td><td>8-bit</td></tr><tr><td>832 x 624</td><td>n/a-bit</td></tr><tr><td>1024 x 768</td><td>8-bit</td></tr><tr><td>1152 x 870</td><td>n/a-bit</td></tr><tr><td>1280 x 1024</td><td>n/a-bit</td></tr></tbody></table>				Resolution	Video Memory 1MB DRAM (built in)	512 x 384	n/a-bit	640 x 400	n/a-bit	640 x 480	8-bit	800 x 600	8-bit	832 x 624	n/a-bit	1024 x 768	8-bit	1152 x 870	n/a-bit	1280 x 1024	n/a-bit
Resolution	Video Memory 1MB DRAM (built in)																						
512 x 384	n/a-bit																						
640 x 400	n/a-bit																						
640 x 480	8-bit																						
800 x 600	8-bit																						
832 x 624	n/a-bit																						
1024 x 768	8-bit																						
1152 x 870	n/a-bit																						
1280 x 1024	n/a-bit																						
RAM Slots:	8, 168-pin DIMM																						
Min - Max RAM:	32 MB - 512 MB																						
Min RAM Speed:	60																						
RAM Sizes:	8, 16, 32, 64 MB																						
Install in Groups of:	2																						
Notes:	Supports parity memory.																						
Physical		Software		Storage																			
Introduced:	2/26/1996	Addressing Modes: 32-bit		Floppy Size:	1.44MB																		
Discontinued:	n/a	Orig SSW: AIX 4.1.4		Floppy Inject:	manual																		
Form Factor:	NW Server 700	Orig Enabler: n/a		Min. Int HD Size:	1-4GB																		
Gestalt ID:		ROM ID: n/a		Int HD Interface:	SCSI																		
Weight (lbs):	84	ROM Ver: n/a		Orig CD Speed:	4x																		
Dimensions (in):	24.5 H x 16.5 W x 18 D	ROM Size: n/a		Int CD Support:	yes																		
Notes:	The weight of this configuration may vary.	AppleTalk Ver: n/a		Notes:	Supports optional redundant hot-pluggable disk drives.																		
		Mac OS Supported:																					
		Notes: Ships with AIX for Apple Network Servers.																					




# Network Server 700/200: Technical Specifications

## Network Server 700/200

Logic Board		Ports		Power																					
Processor:	604e, 200	USB:		Max Watts:	425																				
PMMU:	integrated	ADB: 1		Amps:	7																				
FPU:	integrated	Video: HDI-15		BTU per Hr:	1453.5																				
Data Path:	64, 50	Floppy: none		Voltage:	100-240																				
L1 Cache:	64K	SCSI: DB-25		Freq Range:	50-60 Hz																				
L2 Cache:	1MB	Geoports:		Battery Type:	3.6V lithium																				
2nd Processor:	none	Ethernet: AAUI-15		Soft Power:	yes																				
Slots:	6 PCI	FireWire:		Notes:	Supports optional redundant hot-pluggable power supplies.																				
		Mic Type: PlainTalk																							
		AirPort Ready:																							
		Other Ports: Printer Modem Speaker ,																							
		Port Notes: This system has two serial ports. However, they are not labelled "Printer" and "Modem".																							
Memory		Video Memory																							
Logic Board:	none	<table><thead><tr><th>Resolution</th><th>Video Memory</th></tr></thead><tbody><tr><td></td><td>1MB DRAM (built in)</td></tr><tr><td>512 x 384</td><td>n/a-bit</td></tr><tr><td>640 x 400</td><td>n/a-bit</td></tr><tr><td>640 x 480</td><td>8-bit</td></tr><tr><td>800 x 600</td><td>8-bit</td></tr><tr><td>832 x 624</td><td>n/a-bit</td></tr><tr><td>1024 x 768</td><td>8-bit</td></tr><tr><td>1152 x 870</td><td>n/a-bit</td></tr><tr><td>1280 x 1024</td><td>n/a-bit</td></tr></tbody></table>				Resolution	Video Memory		1MB DRAM (built in)	512 x 384	n/a-bit	640 x 400	n/a-bit	640 x 480	8-bit	800 x 600	8-bit	832 x 624	n/a-bit	1024 x 768	8-bit	1152 x 870	n/a-bit	1280 x 1024	n/a-bit
Resolution	Video Memory																								
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640 x 400	n/a-bit																								
640 x 480	8-bit																								
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832 x 624	n/a-bit																								
1024 x 768	8-bit																								
1152 x 870	n/a-bit																								
1280 x 1024	n/a-bit																								
RAM Slots:	8, 168-pin DIMM																								
Min - Max RAM:	48 MB - 512 MB																								
Min RAM Speed:	60																								
RAM Sizes:	8, 16, 32, 64 MB																								
Install in Groups of:	2																								
Notes:	Supports parity memory.																								
Physical		Software		Storage																					
Introduced:	9/14/1996	Addressing Modes:		Floppy Size:	1.44MB																				
Discontinued:	n/a	Orig SSW:		Floppy Inject:	manual																				
Form Factor:	NW Server 700	Orig Enabler:		Min. Int HD Size:	2x4GB																				
Gestalt ID:		ROM ID:		Int HD Interface:	SCSI																				
Weight (lbs):	84	ROM Ver:		Orig CD Speed:	8x																				
Dimensions (in):	24.5 H x 16.5 W x 18 D	ROM Size:		Int CD Support:	yes																				
Notes:	The weight of this configuration may vary.	AppleTalk Ver:		Notes:	Supports optional redundant hot-pluggable disk drives.																				
		Mac OS Supported:																							
		Notes: Ships with AIX for Apple Network Servers.																							


# Workgroup Server 60: Technical Specifications

## Workgroup Server 60

Logic Board	Ports	Power
Processor: 68040, 40	USB:	Max Watts: 86
PMMU: integrated	ADB: 2	Amps: 1.7
FPU: integrated	Video: DB-15	BTU per Hr: 294.12
Data Path: 32, 20	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7  NuBus or PDS	FireWire:	
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 1MB VRAM (2x256K)
RAM Slots: 4, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 8 MB - 68 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	8-bit 16-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 7/26/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 10/17/1993	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: Centris 610	Orig Enabler: System Enabler 040 v1.1	Min. Int HD Size: 250, 500MB
Gestalt ID: 52	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$23	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.5.3 7.5.1 7.5.5 7.6 7.6.1 8.0	

# Workgroup Server 60 (50/25 MHz): Technical Specifications

## Workgroup Server 60 (50/25 MHz)

Logic Board	Ports	Power
Processor: 68040, 50	USB:	Max Watts: 86
PMMU: integrated	ADB: 2	Amps: 1.7
FPU: integrated	Video: DB-15	BTU per Hr: 294.12
Data Path: 32, 25	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7  NuBus or PDS	FireWire:	
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 1MB VRAM (2x256K)
RAM Slots: 4, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 8 MB - 68 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	8-bit 16-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 10/1/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 10/17/1994	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: Centris 610	Orig Enabler: System Enabler 040 v1.1	Min. Int HD Size: 250, 500MB
Gestalt ID: 53	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$23	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.5.3 7.5.1 7.5.5 7.6 7.6.1 8.0	

# iPod nano (Second Generation) - Technical Specifications

## iPod nano (Second Generation) - Technical Specifications

Storage/capacity	2GB (500 songs)	4GB (1,000 songs)	8GB (2,000 songs)
Color	Silver	Silver, Green, Blue, Pink, Red	Black, Red
Battery life	Up to 24 hours of music playback; up to 5 hours of slideshows with music		
Display	1.5-inch (diagonal) color LCD with LED backlight		
Ports	Dock connector, stereo minijack		
Connectivity	USB through dock connector		
Charge time	About 3 hours (1.5-hour fast charge to 80% capacity)		
Audio support	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3 and 4), Apple Lossless, WAV, AIFF		
Photo support	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only) and PNG formats		
Video support	N/A		
Size	3.5 x 1.6 x 0.26 inches		
Weight	1.41 ounces		
Included accessories	Earphones, USB cable, dock adapter		

### Options & Accessories

Available from the online Apple Store or an authorized Apple reseller.

#### Accessories

- iPod nano Lanyard Headphones MA597G/A
- iPod nano Armband (Gray) MA094G/A
- Nike+iPod Sport Kit MA365LL/A
- iPod Hi-Fi M9867LL/A
- iPod Radio Remote MA070G/A
- AV Connection Kit MA242LL/A

#### Dock

- iPod nano Dock MA594G/A

#### Headphones

- In-Ear Headphones M9394G/A

#### Cables and adapters

- iPod USB Power Adapter MA592G/A
- USB 2.0 to Apple iPod Dock Connector Cable M9569G/A
- World Travel Adapter Kit M8794G/B

#### Services

- AppleCare Protection Plan M9404LL/A

### Technical Specifications

#### Size and weight

- Height: 3.5 inches
- Width: 1.6 inches
- Depth: 0.26 inch
- Weight: 1.41 ounces

#### In the box

- iPod nano
- Earphones
- USB 2.0 cable
- Dock adapter
- Quick Start guide

# 25\_iPod nano (Second Generation) - Technical Specifications.pdf

## Capacity

- 2GB, 4GB, or 8GB flash drive<sup>(1)</sup>
- Holds up to 500 to 2,000 songs in 128-Kbps AAC format<sup>(2)</sup>
- Holds up to 25,000 iPod nano-viewable photos<sup>(3)</sup>
- Stores data via USB flash drive

## Display

- 1.5-inch (diagonal) liquid crystal display with blue-white LED backlight
- 176-by-132-pixel resolution, .168-mm dot pitch
- Support for display of multiple languages and characters simultaneously

## Audio

- Skip-free playback
- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, AIFF, and WAV
- User-configurable maximum [volume limit](#)

## Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Mac system requirements

- Macintosh computer with USB 2.0 port
- Mac OS X v10.3.9 or later
- iTunes 7 or later<sup>(4)</sup>

## Windows system requirements

- PC with USB 2.0
- Windows 2000 with Service Pack 4 or later, or Windows XP Home or Professional with Service Pack 2 or later
- iTunes 7 or later<sup>(4)</sup>

## Languages

- Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, and Turkish
- Additional language support for display of song, album, and artist information: Bulgarian, Croatian, Romanian, Serbian, Slovak, Slovenian, and Ukrainian

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Input and output

- Dock connector
- 3.5-mm stereo headphone jack

## Power and battery<sup>(5)</sup>

- Built-in rechargeable lithium ion battery
- Music playback time: Up to 24 hours when fully charged<sup>(3)</sup>
- Photo slideshow with music viewing time: Up to 5 hours when fully charged<sup>(3)</sup>
- Charging via USB or FireWire to computer system or power adapter (sold separately)
  - Fast-charge time: about 1.5 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 3 hours

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Song capacity is based on 4 minutes per song and 128-Kbps AAC encoding; actual capacity varies by content.

3. Photo capacity is based on iPod-viewable photos transferred from iTunes.

4. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

5. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

# Workgroup Server 80: Technical Specifications

## Workgroup Server 80

Logic Board	Ports	Power
Processor: 68040, 66	USB:	Max Watts: 200
PMMU: integrated	ADB: 1	Amps: 9
FPU: integrated	Video: DB-15	BTU per Hr: 684
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: 3 NuBus, 1 PDS	FireWire:	Pass Through: yes
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 1MB VRAM (2x256K)
RAM Slots: 4, 72-pin SIMM	512 x 384	16-bit 16-bit
Min - Max RAM: 8 MB - 136 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 60	640 x 480	8-bit 16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	8-bit 16-bit
Install in Groups of: 1	832 x 624	8-bit 16-bit
	1024 x 768	4-bit 8-bit
	1152 x 870	4-bit 8-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 3/22/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 10/17/1994	Orig SSW: 7.1	Floppy Inject: auto
Form Factor: Quadra 800	Orig Enabler: System Enabler 040 v1.1	Min. Int HD Size: 500MB-1GB
Gestalt ID: 35	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 24	ROM Ver: \$23	Orig CD Speed 2x
Dimensions (in): 14 H x 7.7 W x 15.75 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1 7.5.3 7.5.1 7.5.5 7.6 7.6.1 8.0	


# Workgroup Server 95: Technical Specifications

## Workgroup Server 95

Logic Board	Ports	Power
Processor: 68040, 66	USB:	Max Watts: 303
PMMU: integrated	ADB: 1	Amps: 10
FPU: integrated	Video: DB-15	BTU per Hr: 1036.26
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: 5 NuBus, 1 PDS	FireWire:	Pass Through: yes
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 1MB VRAM (built in) Video Memory 2MB VRAM (4x256K)
RAM Slots: 16, 30-pin SIMM	512 x 384	16-bit 24-bit
Min - Max RAM: 8 MB - 256 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	16-bit 24-bit
RAM Sizes: 1, 4, 8, 16 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 4	832 x 624	16-bit 24-bit
	1024 x 768	8-bit 16-bit
	1152 x 870	8-bit 16-bit
	1280 x 1024	n/a-bit n/a-bit
	Notes: 512K VRAM SIMMs may be installed, but only 256K of each SIMM will be used.	
Physical	Software	Storage
Introduced: 3/22/1993	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 4/17/1995	Orig SSW: A/UX 3.0.1	Floppy Inject: auto
Form Factor: Quadra 900	Orig Enabler: none	Min. Int HD Size: 230MB-1GB
Gestalt ID: 26	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 36.8	ROM Ver: \$17	Orig CD Speed 2x
Dimensions (in): 18.6 H x 8.9 W x 20.6 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported:	

# Workgroup Server 6150: Technical Specifications

## Workgroup Server 6150


Logic Board	Ports	Power
Processor: 601, 60	USB:	Max Watts: 210
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: HDI-45	BTU per Hr: 718.2
Data Path: 64, 30	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7  NuBus or PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 8 MB - 72 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 2	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 4/25/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 4/17/1995	Orig SSW: 7.1.2	Floppy Inject: manual
Form Factor: Centris 610	Orig Enabler: PowerPC Enabler v1.0	Min. Int HD Size: 500MB
Gestalt ID: 75	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$A4	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.1.2 7.5.3 7.5.1 7.5.5 7.6 7.6.1 8.0	

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# Workgroup Server 6150/66: Technical Specifications

## Workgroup Server 6150/66

Logic Board	Ports	Power
Processor: 601, 66	USB:	Max Watts: 210
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: HDI-45	BTU per Hr: 718.2
Data Path: 64, 30	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7  NuBus or PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8M B	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 16 MB - 72 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 2	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 4/3/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.1	Floppy Inject: manual
Form Factor: Centris 610	Orig Enabler: none	Min. Int HD Size: 700MB-1.2GB
Gestalt ID: 100	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: n/a	Orig CD Speed 4x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.1.5	
	Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	

Published Date: Jul 26, 2017

# Workgroup Server 7250/120: Technical Specifications

## Workgroup Server 7250/120

Logic Board		Ports		Power	
Processor:	601, 120	USB:		Max Watts:	150
PMMU:	integrated	ADB: 1		Amps:	3
FPU:	integrated	Video: DB-15		BTU per Hr:	513
Data Path:	64, 40	Floppy: none		Voltage:	100-270
L1 Cache:	32K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports: 2		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet: AAUI, 10baseT		Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (1x1MB)	Video Memory 4MB VRAM (3x1MB)
RAM Slots:	4, 168-pin DIMM				
Min - Max RAM:	16 MB - 256 MB	512 x 384	24-bit	24-bit	24-bit
Min RAM Speed:	70	640 x 400	n/a-bit	n/a-bit	n/a-bit
RAM Sizes:	8, 16, 32, 64 MB	640 x 480	16-bit	24-bit	24-bit
Install in Groups of:	1	800 x 600	16-bit	24-bit	24-bit
Notes:	128MB DIMMs can be used, but have not been tested.	832 x 624	16-bit	24-bit	24-bit
		1024 x 768	8-bit	16-bit	24-bit
		1152 x 870	8-bit	16-bit	24-bit
		1280 x 1024	n/a-bit	8-bit	16-bit
Physical		Software		Storage	
Introduced:	2/26/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	none	Min. Int HD Size:	1.2-2GB
Gestalt ID:	108	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	n/a	Orig CD Speed	4x, 8x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.0		
		Mac OS Supported:	7.5.3 7.5.5 7.6 7.6.1 8.0		

# Workgroup Server 7350/180: Technical Specifications

## Workgroup Server 7350/180

Logic Board		Ports		Power	
Processor:	604e, 180	USB:		Max Watts:	150
PMMU:	integrated	ADB: 1		Amps:	3
FPU:	integrated	Video: DB-15		BTU per Hr:	513
Data Path:	64, 45	Floppy: none		Voltage:	100-130/200-270
L1 Cache:	64K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports: 2		Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatbility Card	Ethernet: AAUI, 10baseT		Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker			
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	48 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	4/21/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.6.1	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	none	Min. Int HD Size:	4GB
Gestalt ID:	109	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$34	Orig CD Speed	12x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	n/a		
		Mac OS Supported:	7.6.1 8.0		

# Workgroup Server 8150: Technical Specifications

## Workgroup Server 8150

Logic Board		Ports	Power
Processor:	601, 80	USB:	Max Watts: 200
PMMU:	integrated	ADB:	Amps: 9
FPU:	integrated	Video:	BTU per Hr: 684
Data Path:	64, 40	Floppy:	Voltage: 100-240
L1 Cache:	32K	SCSI:	Freq Range: 50-60 Hz
L2 Cache:	256K	Geoports:	Battery Type: 3.6V lithium
2nd Processor:	none	Ethernet:	Soft Power: yes
Slots:	3 NuBus, 1 PDS	FireWire:	Pass Through: yes
		Mic Type:	PlainTalk
		AirPort Ready:	
		Other Ports:	Printer Modem Speaker ,
Memory		Video Memory	
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots:	8, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM:	8 MB - 264 MB	640 x 400	n/a-bit
Min RAM Speed:	80	640 x 480	16-bit
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of:	2	832 x 624	8-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
Physical		Software	Storage
Introduced:	4/25/1994	Addressing Modes:	32-bit
Discontinued:	4/17/1995	Orig SSW:	7.1.2
Form Factor:	Quadra 800	Orig Enabler:	PowerPC Enabler v1.0
Gestalt ID:	65	ROM ID:	\$077D
Weight (lbs):	25.3	ROM Ver:	\$20
Dimensions (in):	14 H x 7.7 W x 15.75 D	ROM Size:	4MB
		AppleTalk Ver:	58.0.2
		Mac OS Supported:	7.1.2 7.5.3 7.5.1 7.5.5 7.6 8.0 7.6.1
			Floppy Size: 1.44MB
			Floppy Inject: manual
			Min. Int HD Size: 500MB, 1GB
			Int HD Interface: SCSI
			Orig CD Speed 2x
			Int CD Support: yes

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# Workgroup Server 8150/110: Technical Specifications

## Workgroup Server 8150/110

Logic Board		Ports	Power
Processor:	601+, 110	USB:	Max Watts: 200
PMMU:	integrated	ADB: 1	Amps: 9
FPU:	integrated	Video: HDI-45	BTU per Hr: 684
Data Path:	64, 36.7	Floppy: none	Voltage: 100-240
L1 Cache:	32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache:	256K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor:	none	Ethernet: AAUI-15	Soft Power: yes
Slots:	3 NuBus, 1 PDS	FireWire:	Pass Through: yes
		Mic Type: PlainTalk	
		AirPort Ready:	
		Other Ports: Printer Modem Speaker ,	
Memory		Video Memory	
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots:	8, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM:	16 MB - 264 MB	640 x 400	n/a-bit
Min RAM Speed:	80	640 x 480	16-bit
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of:	2	832 x 624	8-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
Physical		Software	Storage
Introduced:	4/3/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued:	4/22/1996	Orig SSW: 7.5.1	Floppy Inject: manual
Form Factor:	Quadra 800	Orig Enabler: none	Min. Int HD Size: 1GB
Gestalt ID:	40	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs):	25.3	ROM Ver: n/a	Orig CD Speed: 4x
Dimensions (in):	14 H x 7.7 W x 15.75 D	ROM Size: 4MB	Int CD Support: yes
		AppleTalk Ver: 58.1.5	
		Mac OS Supported: 7.5.3 7.5.1 7.5.5 7.6 8.0 7.6.1	

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# Workgroup Server 8550/132: Technical Specifications

## Workgroup Server 8550/132

Logic Board		Ports		Power	
Processor:	604, 132	USB:		Max Watts:	225
PMMU:	integrated	ADB: 1		Amps:	9
FPU:	integrated	Video: DB-15		BTU per Hr:	769.5
Data Path:	64, 44	Floppy: none		Voltage:	100-240
L1 Cache:	32K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	512K	Geoports: 2		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet: AAUI, 10baseT		Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	24 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	2/26/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	Quadra 800	Orig Enabler:	none	Min. Int HD Size:	2GB
Gestalt ID:	69	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	25	ROM Ver:	n/a	Orig CD Speed	4x
Dimensions (in):	14 H x 7.7 W x 15.75 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.0		
		Mac OS Supported:	7.5.3 7.5.5 7.6 7.6.1 8.0		

# Workgroup Server 8550/200: Technical Specifications

## Workgroup Server 8550/200

Logic Board		Ports		Power	
Processor:	604e, 200	USB:		Max Watts:	225
PMMU:	integrated	ADB:	1	Amps:	9
FPU:	integrated	Video:	DB-15	BTU per Hr:	769.5
Data Path:	64, 50	Floppy:	none	Voltage:	100-240
L1 Cache:	64K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	512K	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	32 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	9/14/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	Quadra 800	Orig Enabler:	none	Min. Int HD Size:	2GB
Gestalt ID:	69	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	25	ROM Ver:	n/a	Orig CD Speed	8x
Dimensions (in):	14 H x 7.7 W x 15.75 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.0		
		Mac OS Supported:	7.5.3 8.0 7.6.1 7.5.5 7.6		

# Fifth Generation iPod (Late 2006) - Technical Specifications

This article has been archived and is no longer updated by Apple.

Storage/capacity	30GB (7,500 songs)	80GB (20,000 songs)
Color	Black, White	Black, White
Battery life	Up to 14 hours of music playback; up to 4 hours of slideshows with music; up to 3.5 hours of video playback	Up to 20 hours of music playback; up to 6 hours of slideshows with music; up to 6.5 hours of video playback
Display	2.5-inch (diagonal) color LCD with LED backlight	
Ports	Dock connector, stereo minijack, composite video and audio through minijack	
Connectivity	USB through dock connector; composite video (with AV cable, sold separately) and audio through headphone jack or line out on the iPod Universal Dock (sold separately)	
Charge time	About 4 hours (2-hour fast charge to 80% capacity)	
Audio support	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3 and 4), Apple Lossless, WAV, AIFF	
Photo support	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats	
Video support	H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per sec., Baseline Low-Complexity Profile with AAC-LC audio up to 160 Kbps, 48 kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 768 Kbps, 320 by 240 pixels, 30 frames per sec., Baseline Profile up to Level 1.3 with AAC-LC audio up to 160 Kbps, 48 kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per sec., Simple Profile with AAC-LC audio up to 160 Kbps, 48 kHz, stereo audio in .m4v, .mp4, and .mov file formats	
Size	4.1 x 2.4 x 0.43 inches	4.1 x 2.4 x 0.55 inches
Weight	4.8 ounces	5.5 ounces
Included accessories	Earphones, USB cable, dock adapter, case	

## Options & Accessories

Available from the online Apple Store or an authorized Apple reseller

- Accessories**  
iPod Hi-Fi M9867LL/A  
Leather Case MA399G/A  
iPod Socks M9720G/A  
iPod Radio Remote MA070G/A

- Dock**  
iPod Universal Dock MA045G/A

- Cables and adapters**  
iPod Camera Connector M9861G/A  
iPod AV Cable M9765G/A  
iPod USB Power Adapter MA592G/A  
USB 2.0 to Apple iPod Dock Connector Cable M9569G/A  
World Travel Adapter Kit M8794G/B

- Remote control**  
Apple Remote MA128G/A

- Headphones**  
In-Ear Headphones M9394G/A

- Services**  
AppleCare Protection Plan M9404LL/A



# 26\_Fifth Generation iPod (Late 2006) - Technical Specifications.pdf

## Technical Specifications

### Size and weight (30GB model)

- Height: 4.1 inches
- Width: 2.4 inches
- Depth: 0.43 inch
- Weight: 4.8 ounces

### Size and weight (80GB model)

- Height: 4.1 inches
- Width: 2.4 inches
- Depth: 0.55 inch
- Weight: 5.5 ounces

### In the box

- iPod
- Earphones
- USB 2.0 cable
- Dock adapter for use with Universal Dock
- Case
- Quick Start guide

### Capacity

- 30GB or 80GB hard drive<sup>(1)</sup>
- Holds up to 7,500 (30GB) or 20,000 songs (80GB) in 128-Kbps AAC format<sup>(2)</sup>
- Holds up to 25,000 iPod-viewable photos<sup>(3)</sup>
- Holds up to 40 hours (30GB) or up to 100 hours (80GB) of video<sup>(4)</sup>
- Stores data via USB hard drive

### Display

- 2.5-inch (diagonal) QVGA transfective, over 65,000-color liquid crystal display with white LED backlight
- 320 by 240 pixel resolution, .156-mm dot pitch
- Support for display of multiple languages and characters simultaneously

### Audio

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3 and 4), Apple Lossless, AIFF and WAV
- User-configurable maximum volume limit

### Video

- Video formats supported: H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per sec., Baseline Low-Complexity Profile with AAC-LC audio up to 160 Kbps, 48 kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 768 Kbps, 320 by 240 pixels, 30 frames per sec., Baseline Profile up to Level 1.3 with AAC-LC audio up to 160 Kbps, 48 kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per sec., Simple Profile with AAC-LC audio up to 160 Kbps, 48 kHz, stereo audio in .m4v, .mp4, and .mov file formats

### Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

### Mac system requirements

- Macintosh computer with USB 2.0 port
- Mac OS X v10.3.9 or later
- iTunes 7 or later<sup>(5)</sup>

### Windows system requirements

- PC with USB 2.0
- Windows 2000 with Service Pack 4 or later, or Windows XP Home or Professional with Service Pack 2 or later
- iTunes 7 or later<sup>(5)</sup>

### Languages

- Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, and Turkish
- Additional language support for display of song, album and artist information: Bulgarian, Croatian, Romanian, Serbian, Slovak, Slovenian, and Ukrainian

### Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

# 26\_Fifth Generation iPod (Late 2006) - Technical Specifications.pdf

## Input and output

- iPod
  - Dock connector
  - 3.5-mm stereo headphone minijack
- iPod Universal Dock
  - Dock connector
  - Audio and composite video output
  - S-video output

## Power and battery<sup>(6)</sup>

- Built-in rechargeable lithium ion battery
- Playback time (30GB model)
  - Music playback time: Up to 14 hours when fully charged
  - Photo slideshow with music viewing time: Up to 4 hours when fully charged
  - Video playback time: Up to 3.5 hours when fully charged
- Playback time (80GB model)
  - Music playback time: Up to 20 hours when fully charged
  - Photo slideshow with music viewing time: Up to 6 hours when fully charged
  - Video playback time: Up to 6.5 hours when fully charged
- Charging via USB or FireWire to computer system or power adapter (sold separately)
  - Fast-charge time: about 2 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 4 hours

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Song capacity based on 4 minutes per song and 128-Kbps AAC encoding; actual capacity varies by content.

3. Photo capacity is based on iPod-viewable photos transferred from iTunes.

4. Video capacity based on H.264 1.5-Mbps video at 640 by 480 resolution combined with 128-Kbps audio; actual capacity varies by content.

5. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

6. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

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# Workgroup Server 9150: Technical Specifications

## Workgroup Server 9150

Logic Board		Ports		Power	
Processor:	601, 80	USB:		Max Watts:	303
PMMU:	integrated	ADB:		Amps:	10
FPU:	integrated	Video:		BTU per Hr:	1036.26
Data Path:	64, 40	Floppy:		Voltage:	100-240
L1 Cache:	32K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	512K	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:		Soft Power:	yes
Slots:	4 NuBus, 1 PDS	FireWire:		Pass Through:	yes
		Mic Type:			
		AirPort Ready:			
		Other Ports:		Printer	
				Modem	
				Speaker	
				,	
Memory		Video Memory			
Logic Board:	8 MB	Video Memory			
RAM Slots:	8, 72-pin SIMM	Resolution	DRAM		
Min - Max RAM:	8 MB - 264 M B		(built in)		
Min RAM Speed:	80	512 x 384	16-bit		
RAM Sizes:	4, 8, 16, 32 MB	640 x 400	n/a-bit		
Install in Groups of:	2	640 x 480	16-bit		
		800 x 600	n/a-bit		
		832 x 624	8-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	4/25/1994	Addressing Modes:		Floppy Size:	1.44MB
Discontinued:	4/17/1995	Orig SSW:		Floppy Inject:	manual
Form Factor:	Quadra 900	Orig Enabler:		Min. Int HD Size:	1, 2GB
Gestalt ID:	39	ROM ID:		Int HD Interface:	SCSI
Weight (lbs):	36.8	ROM Ver:		Orig CD Speed	2x
Dimensions (in):	18.6 H x 8.9 W x 20.6 D	ROM Size:		Int CD Support:	yes
		AppleTalk Ver:			
		Mac OS			
		Supported:			

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# Workgroup Server 9150/120: Technical Specifications

## Workgroup Server 9150/120

Logic Board		Ports		Power	
Processor:	601, 120	USB:		Max Watts:	303
PMMU:	integrated	ADB:		Amps:	10
FPU:	integrated	Video:		BTU per Hr:	1036.26
Data Path:	64, 40	Floppy:		Voltage:	100-240
L1 Cache:	32K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	1MB	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:		Soft Power:	yes
Slots:	4 NuBus, 1 PDS	FireWire:		Pass Through:	yes
		Mic Type:			
		AirPort Ready:			
		Other Ports:			
			Printer		
			Modem		
			Speaker		
			,		
Memory		Video Memory			
Logic Board:	8 MB				
RAM Slots:	8, 72-pin SIMM	Resolution	Video Memory		
Min - Max RAM:	16 MB - 264 MB		DRAM		
Min RAM Speed:	80		(built in)		
RAM Sizes:	4, 8, 16, 32 MB	512 x 384	16-bit		
Install in Groups of:	2	640 x 400	n/a-bit		
		640 x 480	16-bit		
		800 x 600	n/a-bit		
		832 x 624	8-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	4/3/1995	Addressing Modes: 32-bit		Floppy Size:	1.44MB
Discontinued:	5/18/1996	Orig SSW:	7.5.1	Floppy Inject:	manual
Form Factor:	Quadra 900	Orig Enabler:	Workgroup Server Enabler	Min. Int HD Size:	2x1GB, 2GB
Gestalt ID:	57	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	36.8	ROM Ver:	\$25	Orig CD Speed	4x
Dimensions (in):	18.6 H x 8.9 W x 20.6 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	58.1.5		
		Mac OS	7.5.1		
		Supported:	7.5.3		
			7.6		
			7.5.5		
			8.0		
			7.6.1		

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# Workgroup Server 9650/233: Technical Specifications

## Workgroup Server 9650/233

Logic Board		Ports	Power
Processor:	604e, 233	USB:	Max Watts: 390
PMMU:	integrated	ADB: 1	Amps: 3
FPU:	integrated	Video: DB-15	BTU per Hr: 1333.8
Data Path:	64, 50	Floppy: none	Voltage: 100-125/200
L1 Cache:	64K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache:	512K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor:	opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Soft Power: yes
Slots:	6 PCI	FireWire:	Pass Through: yes
		Mic Type: PlainTalk	
		AirPort Ready:	
		Other Ports: Printer, Modem, Speaker	
Memory		Video Memory	
Logic Board:	none	Resolution	Video Memory video card (4MB) (n/a)
RAM Slots:	12, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM:	64 MB - 768 MB	640 x 400	n/a-bit
Min RAM Speed:	70	640 x 480	24-bit
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit
Install in Groups of:	1	832 x 624	24-bit
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	24-bit
		1152 x 870	24-bit
		1280 x 1024	24-bit
		Notes: A video card ships bundled with this system. The bundled video card is capable of resolutions up to 1600x1200.	
Physical		Software	Storage
Introduced:	4/21/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued:	n/a	Orig SSW: 7.6.1	Floppy Inject: manual
Form Factor:	PM 9600	Orig Enabler: none	Min. Int HD Size: 4GB, 2x4GB
Gestalt ID:	67	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs):	35	ROM Ver: \$34	Orig CD Speed: 12x
Dimensions (in):	17.3 H x 9.7 W x 17.3 D	ROM Size: 4MB	Int CD Support: yes
		AppleTalk Ver: n/a	
		Mac OS Supported: 7.6.1, 8.0	

# Workgroup Server 9650/350: Technical Specifications

## Workgroup Server 9650/350

Logic Board	Ports	Power
Processor: 604e, 350	USB:	Max Watts: 390
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 1333.8
Data Path: 64, 100	Floppy: none	Voltage: 100-125/200
L1 Cache: 64K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 512K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Soft Power: yes
Slots: 6 PCI	FireWire:	Pass Through: yes
Notes: Three PCI slots are occupied by SCSI, video, and Ethernet cards. System supports 100 MHz cache bus, and 50 MHz system bus speeds.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
	Port Notes: Ethernet 100T port on PCI card.	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory video card (n/a)
RAM Slots: 12, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 64 MB - 768 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
	1024 x 768	24-bit
	1152 x 870	24-bit
	1280 x 1024	24-bit
	Notes: A video card ships bundled with this system. The bundled video card is capable of resolutions up to 1600x1200.	
Physical	Software	Storage
Introduced: 8/5/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.6.1	Floppy Inject: manual
Form Factor: PM 9600	Orig Enabler: n/a	Min. Int HD Size: 2x4GB
Gestalt ID: 67	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 35	ROM Ver: n/a	Orig CD Speed: 24x
Dimensions (in): 17.3 H x 9.7 W x 17.3 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	Notes: Includes SCSI PCI card for additional Ultra/Wide SCSI-3 port.
	Mac OS Supported: 7.6.1 8.0	

# Apple ColorSync/AppleVision 750 Display: Technical Specifications

## Apple ColorSync/AppleVision 750 Display

Physical			Power		
Introduced:	8/5/1997		Max Watts:	130	
Discontinued:	n/a		Amps:	1.9	
Tube Size:	17"		BTU per Hr:	444.6	
Viewable Size:	16.1" VIS		Voltage:	100-120/220-240	
Tube Type:	Trinitron		Freq Range:	50-60 Hz	
Weight (lbs):	49				
Dimensions (in):	16.8 H x 16.2 W x 17.6 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	60 Hz	31.5 kHz	50
	Macintosh	640x480	66.67 Hz	34.97 kHz	50
	VESA	800x600	60.31 Hz	37.9 kHz	62
	VESA	800x600	75 Hz	46.9 kHz	62
	Macintosh	832x624	74.55 Hz	49.7 kHz	65
	VESA	1024x768	60 Hz	48.4 kHz	80
	Macintosh	1024x768	74.93 Hz	60.24 kHz	80
	Macintosh	1152x870	75 Hz	68.7 kHz	90
	VESA	1280x1024	60 Hz	64.3 kHz	102
	VESA	1280x1024	75.03 Hz	79.98 kHz	102

# Apple ColorSync AV/AppleVision 750AV Display: Technical Specifications

## Apple ColorSync AV/AppleVision 750AV Display

Physical			Power		
Introduced:	8/5/1997		Max Watts:	130	
Discontinued:	n/a		Amps:	1.9	
Tube Size:	17"		BTU per Hr:	444.6	
Viewable Size:	16.1" VIS		Voltage:	100-120/220-240	
Tube Type:	Trinitron		Freq Range:	50-60 Hz	
Weight (lbs):	60				
Dimensions (in):	19.7 H x 15.8 W x 17.6 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	60 Hz	31.5 kHz	50
	Macintosh	640x480	66.67 Hz	34.97 kHz	50
	VESA	800x600	60.31 Hz	37.9 kHz	62
	VESA	800x600	75 Hz	46.9 kHz	62
	Macintosh	832x624	74.55 Hz	49.7 kHz	65
	VESA	1024x768	60 Hz	48.4 kHz	80
	Macintosh	1024x768	74.93 Hz	60.24 kHz	80
	Macintosh	1152x870	75 Hz	68.7 kHz	90
	VESA	1280x1024	60 Hz	64.3 kHz	102
	VESA	1280x1024	75.03 Hz	79.98 kHz	102



# AppleVision 1710 Display: Technical Specifications

## AppleVision 1710 Display

Physical			Power		
Introduced:	12/16/1995		Max Watts: 130		
Discontinued:	n/a		Amps: 1.9		
Tube Size:	17"		BTU per Hr: 444.6		
Viewable Size:	16.1" VIS		Voltage: 100-120/220-240		
Tube Type:	Trinitron		Freq Range: 50-60 Hz		
Weight (lbs):	49				
Dimensions (in):	16.8 H x 16.2 W x 17.6 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	60 Hz	31.5 kHz	50
	Macintosh	640x480	66.67 Hz	34.97 kHz	50
	VESA	800x600	60.31 Hz	37.9 kHz	62
	VESA	800x600	75 Hz	46.9 kHz	62
	Macintosh	832x624	74.55 Hz	49.7 kHz	65
	VESA	1024x768	60 Hz	48.4 kHz	80
	Macintosh	1024x768	74.93 Hz	60.24 kHz	80
	Macintosh	1152x870	75 Hz	68.7 kHz	90
	VESA	1280x1024	60 Hz	64.3 kHz	102
	VESA	1280x1024	75.03 Hz	79.98 kHz	102

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# AppleVision 1710AV Display: Technical Specifications

## AppleVision 1710AV Display

Physical			Power		
Introduced:	8/8/1995		Max Watts:	130	
Discontinued:	n/a		Amps:	1.9	
Tube Size:	17"		BTU per Hr:	444.6	
Viewable Size:	16.1" VIS		Voltage:	100-120/220-240	
Tube Type:	Trinitron		Freq Range:	50-60 Hz	
Weight (lbs):	60				
Dimensions (in):	19.7 H x 15.8 W x 17.6 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	60 Hz	31.5 kHz	50
	Macintosh	640x480	66.67 Hz	34.97 kHz	50
	VESA	800x600	60.31 Hz	37.9 kHz	62
	VESA	800x600	75 Hz	46.9 kHz	62
	Macintosh	832x624	74.55 Hz	49.7 kHz	65
	VESA	1024x768	60 Hz	48.4 kHz	80
	Macintosh	1024x768	74.93 Hz	60.24 kHz	80
	Macintosh	1152x870	75 Hz	68.7 kHz	90
	VESA	1280x1024	60 Hz	64.3 kHz	102
	VESA	1280x1024	75.03 Hz	79.98 kHz	102

# Macintosh Performa 520:Technical Specifications

Macintosh Performa 520

Logic Board		Ports		Power	
Processor:	68030, 25	USB:		Max Watts:	40
PMMU:	integrated	ADB:	2	Amps:	.5
FPU:	opt. 68882	Video:	none	BTU per Hr:	136.8
Data Path:	32, 25	Floppy:	none	Voltage:	90-264
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	1 LC PDS	FireWire:			
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,Headphone ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 512K VRAM (built in)	Video Memory 768K VRAM (1x256K)	
RAM Slots:	1, 72-pin SIMM	512 x 384	n/a-bit	n/a-bit	
Min - Max RAM:	4 MB - 36 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	80	640 x 480	8-bit	16-bit	
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit	n/a-bit	
Install in Groups of:	1	832 x 624	n/a-bit	n/a-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	6/28/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	J-7.1	Floppy Inject:	auto
Form Factor:	LC 520	Orig Enabler:	System Enabler 403 vJ2-1.0	Min. Int HD Size:	80-160MB
Gestalt ID:	56	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	40.5	ROM Ver:	n/a	Orig CD Speed	2x
Dimensions (in):	17.9 H x 13.5 W x 16.5 D	ROM Size:	1MB	Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	57.0.4		
		Mac OS Supported:	7.1 7.5 7.1.1 (Pro) 7.5.1 7.5.3 7.5.5 7.6 7.6.1		

# Macintosh Performa 550: Technical Specifications

Macintosh Performa 550

Logic Board		Ports		Power	
Processor:	68030, 33	USB:		Max Watts:	40
PMMU:	integrated	ADB:	2	Amps:	.5
FPU:	opt. 68882	Video:	none	BTU per Hr:	136.8
Data Path:	32, 33	Floppy:	none	Voltage:	90-264
L1 Cache:	0.5K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	1 LC PDS	FireWire:			
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,Headphone ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 512K VRAM (built in)	Video Memory 768K VRAM (1x256K)	
RAM Slots:	1, 72-pin SIMM				
Min - Max RAM:	4 MB - 36 MB				
Min RAM Speed:	80				
RAM Sizes:	1, 2, 4, 8, 16, 32 MB				
Install in Groups of:	1				
		512 x 384	n/a-bit	n/a-bit	
		640 x 400	n/a-bit	n/a-bit	
		640 x 480	8-bit	16-bit	
		800 x 600	n/a-bit	n/a-bit	
		832 x 624	n/a-bit	n/a-bit	
		1024 x 768	n/a-bit	n/a-bit	
		1152 x 870	n/a-bit	n/a-bit	
		1280 x 1024	n/a-bit	n/a-bit	
Physical		Software		Storage	
Introduced:	10/18/1993	Addressing Modes:	24-, 32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.1P3	Floppy Inject:	auto
Form Factor:	LC 520	Orig Enabler:	System Enabler 332	Min. Int HD Size:	160MB
Gestalt ID:	80	ROM ID:	\$067C	Int HD Interface:	SCSI
Weight (lbs):	40.5	ROM Ver:	n/a	Orig CD Speed	2x
Dimensions (in):	17.9 H x 13.5 W x 16.5 D	ROM Size:	1MB	Int CD Support:	yes
		AppleTalk Ver:	57.0.4		
		Mac OS	7.1P3		
		Supported:	7.1P5		
			7.1P6		
			7.5		
			7.5.1		
			7.5.3		
			7.5.5		
			7.6		
			7.6.1		

Published Date: Jul 25, 2017

# iPod shuffle (2nd generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

Storage/capacity	1GB (240 songs)	2GB (500 songs)
Color	Silver, Blue, Green, Purple, Red	Silver, Blue, Green, Purple, Red
Battery life	Up to 12 hours of music playback	
Ports	Stereo minijack	
Connectivity	USB through included dock	
Charge time	About 4 hours (2-hour fast charge to 80% capacity)	
Audio support	AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), WAV, and AIFF	
Size	1.62 x 1.07 x 0.41 inches (41.2 x 27.3 x 10.5 mm including clip)	
Weight	0.55 ounce (15.6 grams)	
Included accessories	Earphones, USB dock	

## Technical Specifications

### Size and weight

- Height: 1.07 inches (27.3 mm)
- Width: 1.62 inches (41.2 mm)
- Depth: 0.41 inch (10.5 mm) (including clip)
- Weight: 0.55 ounce (15.6 grams)

### In the box

- iPod shuffle
- Earphones
- Dock
- Quick Start guide

### Capacity

- 1GB USB flash drive<sup>1</sup>
- Holds up to 240 songs in 128-Kbps AAC format<sup>2</sup>
- Stores data via USB flash drive

### Audio

- Skip-free playback
- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), WAV, and AIFF

### Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

### Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.8 or later
- iTunes 7.4 or later<sup>3</sup>

### Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 2 or later
- iTunes 7.4 or later<sup>3</sup>

### Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

### Input and output

- 3.5-mm stereo headphone minijack

### Power and battery<sup>4</sup>

- Built-in rechargeable lithium polymer battery
- Playtime: Up to 12 hours when fully charged
- Charging via included USB dock
  - Full-charge time: about 4 hours

### Limited warranty and service

# 27\_iPod shuffle (2nd generation) - Technical Specifications.pdf

Your iPod comes with single-incident telephone support for the first 90 days and a one-year limited warranty. Purchase the AppleCare Protection Plan for iPod to extend your service and support to two full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

## Options & Accessories

Available from the [Apple Online Store](#) or an [Apple Authorized Reseller](#).

### Cables and adapters

Apple USB Power Adapter MB051LL/A

World Travel Adapter Kit M8794G/B

### Dock

Extra iPod shuffle Dock MA694G/A

### Headphones

In-Ear Headphones M9394G/B

### Services

AppleCare Protection Plan MA964LL/A

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Music capacity is based on 4 minutes per song and 128-Kbps AAC encoding; actual capacity varies by content.
3. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.
4. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](#)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](#) for more information.

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# Macintosh Performa 560: Technical Specifications

Macintosh Performa 560

Logic Board	Ports	Power
Processor: 68030, 33	USB:	Max Watts: 40
PMMU: integrated	ADB: 2	Amps: .5
FPU: opt. 68882	Video: none	BTU per Hr: 136.8
Data Path: 32, 33	Floppy: none	Voltage: 90-264
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 1 LC PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker Headphone	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (built in) Video Memory 768K VRAM (1x256K)
RAM Slots: 1, 72-pin SIMM	512 x 384	n/a-bit n/a-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit n/a-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 1/1/1994	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.1P5	Floppy Inject: auto
Form Factor: LC 520	Orig Enabler: System Enabler 332	Min. Int HD Size: 160MB
Gestalt ID: 80	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 40.5	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 17.9 H x 13.5 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1P5 7.5 7.1P6 7.5.1 7.5.3 7.5.5 7.6 7.6.1	

Published Date: Jul 25, 2017

# Macintosh Performa 575: Technical Specifications

Macintosh Performa 575

Logic Board	Ports	Power
Processor: 68LC040, 66	USB:	Max Watts: 40
PMMU: integrated	ADB: 1	Amps: .5
FPU: none	Video: none	BTU per Hr: 136.8
Data Path: 32, 33	Floppy: none	Voltage: 90-264
L1 Cache: 8K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 1 LC PDS, comm. slot	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K) Video Memory 1MB VRAM (2x512K)
RAM Slots: 1, 72-pin SIMM	512 x 384	n/a-bit
Min - Max RAM: 5 MB - 36 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 2/1/1994	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.1P6	Floppy Inject: manual
Form Factor: LC 520	Orig Enabler: System Enabler 364	Min. Int HD Size: 250MB
Gestalt ID: 92	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 40.5	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 17.9 H x 13.5 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS 7.1P6	
	Supported: 7.5	
	7.5.1	
	7.5.3	
	7.5.5	
	8.0	
	7.6.1	
	7.6	

Published Date: Jul 26, 2017



# Macintosh Performa 577: Technical Specifications

Macintosh Performa 577

Logic Board	Ports	Power
Processor: 68LC040, 66	USB:	Max Watts: 40
PMMU: integrated	ADB: 1	Amps: .5
FPU: none	Video: none	BTU per Hr: 136.8
Data Path: 32, 33	Floppy: none	Voltage: 90-264
L1 Cache: 8K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 1 LC PDS, comm. slot	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K) Video Memory 1MB VRAM (2x512K)
RAM Slots: 1, 72-pin SIMM	512 x 384	n/a-bit
Min - Max RAM: 5 MB - 36 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 2/1/1994	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.1P6	Floppy Inject: manual
Form Factor: LC 520	Orig Enabler: System Enabler 364	Min. Int HD Size: 250MB
Gestalt ID: 92	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 40.5	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 17.9 H x 13.5 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS 7.1P6	
	Supported: 7.5	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	

Published Date: Jul 25, 2017

# Macintosh Performa 580CD:Technical Specifications

Macintosh Performa 580CD

Logic Board		Ports		Power	
Processor:	68LC040, 66	USB:		Max Watts:	40
PMMU:	integrated	ADB:	1	Amps:	.5
FPU:	none	Video:	opt. DB-15	BTU per Hr:	136.8
Data Path:	32, 33	Floppy:	none	Voltage:	90-264
L1 Cache:	8K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery	4.5V
2nd Processor:	none	Ethernet:	none	Type:	alkaline
Slots:	LC, comm., video in/out	FireWire:		Soft Power:	yes
		Mic Type:	PlainTalk		
		AirPort			
		Ready:			
		Other Ports:	Printer Modem Speaker ,Headphone ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 1MB DRAM (built in)		
RAM Slots:	2, 72-pin SIMM				
Min - Max RAM:	8 MB - 52 MB	512 x 384	n/a-bit		
Min RAM Speed:	80	640 x 400	n/a-bit		
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	640 x 480	16-bit		
Install in Groups of:	1	800 x 600	n/a-bit		
Notes:	Second SIMM slot can accept only 1, 4, or 16MB SIMMs.	832 x 624	n/a-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	5/1/1995	Addressing	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Modes:		Floppy Inject:	manual
Form Factor:	LC 520	Orig SSW:	7.5	Min. Int HD Size:	500MB
Gestalt ID:	99	Orig Enabler:	none	Int HD Interface:	IDE
Weight (lbs):	40.5	ROM ID:	\$067C	Orig CD Speed	2x
Dimensions (in):	17.9 H x 13.5 W x 16.5 D	ROM Ver:	\$32	Int CD Support:	yes
		ROM Size:	1MB		
		AppleTalk Ver:	58.1.3		
		Mac OS	7.5		
		Supported:	7.5.1		
			7.5.3		
			7.5.5		
			7.6		
			7.6.1		
			8.0		

# Macintosh Performa 588CD:Technical Specifications

Macintosh Performa 588CD

Logic Board		Ports		Power	
Processor:	68LC040, 66	USB:		Max Watts:	40
PMMU:	integrated	ADB:	1	Amps:	.5
FPU:	none	Video:	opt. DB-15	BTU per Hr:	136.8
Data Path:	32, 33	Floppy:	none	Voltage:	90-264
L1 Cache:	8K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	none	Geoports:		Battery	4.5V
2nd Processor:	none	Ethernet:	none	Type:	alkaline
Slots:	LC, comm., video in/out	FireWire:		Soft Power:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,Headphone ,		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 1MB DRAM (built in)		
RAM Slots:	2, 72-pin SIMM	512 x 384	n/a-bit		
Min - Max RAM:	8 MB - 52 MB	640 x 400	n/a-bit		
Min RAM Speed:	80	640 x 480	16-bit		
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit		
Install in Groups of:	1	832 x 624	n/a-bit		
Notes:	Second SIMM slot can accept only 1, 4, or 16MB SIMMs.	1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	4/13/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	J-7.5	Floppy Inject:	manual
Form Factor:	LC 520	Orig Enabler:	none	Min. Int HD Size:	500MB
Gestalt ID:	99	ROM ID:	\$067C	Int HD Interface:	IDE
Weight (lbs):	40.5	ROM Ver:	\$32	Orig CD Speed	2x
Dimensions (in):	17.9 H x 13.5 W x 16.5 D	ROM Size:	1MB	Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	58.1.3		
		Mac OS Supported:	7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0		

# Macintosh Performa 600 and 600CD:Technical Specifications

Macintosh Performa 600 and 600CD

Logic Board	Ports	Power
Processor: 68030, 32	USB:	Max Watts: 230
PMMU: integrated	ADB: 2	Amps: 1.9
FPU: opt. 68882	Video: DB-15	BTU per Hr: 786.6
Data Path: 32, 16	Floppy: none	Voltage: 100-240
L1 Cache: 0.5K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: 3 NuBus, 1 PDS	FireWire:	Pass Through: yes
	Mic Type: Omni	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K )
RAM Slots: 4, 30-pin SIMM		Video Memory 1MB VRAM (2x512K)
Min - Max RAM: 4 MB - 68 MB	512 x 384	16-bit
Min RAM Speed: 80	640 x 400	n/a-bit
RAM Sizes: 256 K, 1, 2, 4, 16 MB	640 x 480	8-bit
Install in Groups of: 4	800 x 600	n/a-bit
	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 9/14/1992	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: 10/18/1993	Orig SSW: 7.1P	Floppy Inject: auto
Form Factor: IIvx	Orig Enabler: System Enabler 304	Min. Int HD Size: 160MB
Gestalt ID: 45	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 6 H x 13 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS Supported: 7.1P 7.1P1 7.1P2 7.1P3 7.1P5 7.1P6 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1	

Published Date: Jul 25, 2017

# Macintosh Performa 630 and 630CD:Technical Specifications

Macintosh Performa 630 and 630CD

Logic Board	Ports	Power
Processor: 68LC040, 66	USB:	Max Watts: 45
PMMU: integrated	ADB: 1	Amps: 1.25
FPU: none	Video: DB-15	BTU per Hr: 153.9
Data Path: 32, 33	Floppy: none	Voltage: 100-240
L1 Cache: 8K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: none	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: LC, comm., TV, video in	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 1, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 4 MB - 36 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	8-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 7/1/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.1.2P	Floppy Inject: manual
Form Factor: Quadra 630	Orig Enabler: System Enabler 405	Min. Int HD Size: 250MB
Gestalt ID: 98	ROM ID: \$067C	Int HD Interface: IDE
Weight (lbs): 19	ROM Ver: \$21	Orig CD Speed 2x
Dimensions (in): 4.3 H x 12.6 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS 7.1.2P	
	Supported: 7.5	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	
	8.1	

# Macintosh Performa 630CD DOS Compatible:Technical Specifications

Macintosh Performa 630CD DOS Compatible

Logic Board		Ports		Power	
Processor:	68LC040, 66	USB:		Max Watts:	45
PMMU:	integrated	ADB: 1		Amps:	1.25
FPU:	none	Video: DB-15		BTU per Hr:	153.9
Data Path:	32, 33	Floppy: none		Voltage:	100-240
L1 Cache:	8K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	4.5V alkaline
2nd Processor:	486DX2, 66 MHz	Ethernet: none		Soft Power:	yes
Slots:	Comm., TV, video in	FireWire:			
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,			
		Port Notes: PC game port also available.			
		Sound Notes: Comes with Sound Blaster 16-compatible expansion card.>			
Memory		Video Memory			
Logic Board:	4 MB	Resolution		Video Memory 1MB DRAM (built in)	
RAM Slots:	2, 72-pin SIMM	512 x 384		16-bit	
Min - Max RAM:	8 MB - 52 MB	640 x 400		n/a-bit	
Min RAM Speed:	80	640 x 480		16-bit	
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	800 x 600		8-bit	
Install in Groups of:	1	832 x 624		8-bit	
Notes:	Second SIMM slot can accept only 1, 4, or 16MB SIMMs. DOS card can accept one 72-pin SIMM (◆ 80 ns), up to 32MB in size -- comes with 4MB SIMM installed.	1024 x 768		n/a-bit	
		1152 x 870		n/a-bit	
		1280 x 1024		n/a-bit	
		Notes: Video in not supported at 832x624.			
Physical		Software		Storage	

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Introduced:	5/1/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.1	Floppy Inject:	manual
Form Factor:	Quadra 630	Orig Enabler:	none	Min. Int HD Size:	500MB
Gestalt ID:	98	ROM ID:	\$067C	Int HD Interface:	IDE
Weight (lbs):	19	ROM Ver:	\$32	Orig CD Speed	2x
Dimensions (in):	4.3 H x 12.6 W x 16.5 D	ROM Size:	1MB	Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	58.1.3		
		Mac OS Supported:	7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0		
		Notes:	Includes Microsoft MS-DOS 6.22 and Windows 3.1.		

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# Macintosh Performa 631CD:Technical Specifications

## Macintosh Performa 631CD

Logic Board		Ports	Power
Processor:	68LC040, 66	USB:	Max Watts: 45
PMMU:	integrated	ADB: 1	Amps: 1.25
FPU:	none	Video: DB-15	BTU per Hr: 153.9
Data Path:	32, 33	Floppy: none	Voltage: 100-240
L1 Cache:	8K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache:	none	Geoports:	Battery 4.5V
2nd Processor:	none	Ethernet: none	Type: alkaline
Slots:	LC, comm., TV, video in	FireWire:	Soft Power: yes
		Mic Type: PlainTalk	
		AirPort Ready:	
		Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory		Video Memory	
Logic Board:	4 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots:	2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM:	8 MB - 52 MB	640 x 400	n/a-bit
Min RAM Speed:	80	640 x 480	16-bit
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	800 x 600	8-bit
Install in Groups of:	1	832 x 624	8-bit
Notes:	Second SIMM slot can accept only 1, 4, or 16MB SIMMs.	1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
		Notes: Video in not supported at 832x624.	
Physical		Software	Storage
Introduced:	7/17/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued:	n/a	Orig SSW: 7.5.1	Floppy Inject: manual
Form Factor:	Quadra 630	Orig Enabler: none	Min. Int HD Size: 500MB
Gestalt ID:	98	ROM ID: \$067C	Int HD Interface: IDE
Weight (lbs):	19	ROM Ver: \$21	Orig CD Speed 2x
Dimensions (in):	4.3 H x 12.6 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
		AppleTalk Ver: 57.0.4	
		Mac OS 7.5.1	
		Supported: 7.5.3	
		7.5.5	
		7.6	
		7.6.1	
		8.0	



# Macintosh Performa 635CD: Technical Specifications

Macintosh Performa 635CD

Logic Board		Ports		Power	
Processor:	68LC040, 66	USB:		Max Watts:	45
PMMU:	integrated	ADB:		Amps:	1.25
FPU:	none	Video:		BTU per Hr:	153.9
Data Path:	32, 33	Floppy:		Voltage:	100-240
L1 Cache:	8K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	4.5V alkaline
2nd Processor:	none	Ethernet:		Soft Power:	yes
Slots:	LC, comm., TV, video in	FireWire:			
		Mic Type:		PlainTalk	
		AirPort Ready:			
		Other Ports:		Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory		
RAM Slots:	1, 72-pin SIMM		1MB DRAM (built in)		
Min - Max RAM:	5 MB - 36 MB	512 x 384	16-bit		
Min RAM Speed:	80	640 x 400	n/a-bit		
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	640 x 480	16-bit		
Install in Groups of:	1	800 x 600	8-bit		
		832 x 624	8-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	7/1/1994	Addressing Modes:		Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:		Floppy Inject:	manual
Form Factor:	Quadra 630	Orig Enabler:		Min. Int HD Size:	250MB
Gestalt ID:	98	ROM ID:		Int HD Interface:	IDE
Weight (lbs):	19	ROM Ver:		Orig CD Speed	2x
Dimensions (in):	4.3 H x 12.6 W x 16.5 D	ROM Size:		Int CD Support:	yes
		AppleTalk Ver:			
		Mac OS Supported:			

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# iMac (Late 2006) - Technical Specifications

This article has been archived and is no longer updated by Apple.

	17-inch iMac (MA710LL)	17-inch iMac (MA590LL)	20-inch iMac (MA589LL)	24-inch iMac (MA456LL)
Processor	1.83GHz Intel Core 2 Duo	2.0GHz Intel Core 2 Duo	2.16GHz Intel Core 2 Duo	
L2 Cache	2MB Shared	4MB Shared		
Frontside Bus	667MHz			
Memory	512MB (2x256MB) 667MHz DDR2 SDRAM (PC2-5300), supports up to 2GB	1GB (2x512MB) 667MHz DDR2 SDRAM (PC2-5300), supports up to 3GB		
Hard drive	160GB Serial ATA <sup>(2)</sup> ; 7200 rpm	250GB Serial ATA <sup>(2)</sup> ; 7200 rpm		
Optical drive	24x Combo Drive	Slot-loading 8x SuperDrive with 2.4x Dual Layer burn (DVD+R DL/DVD±RW/CD-RW)		
Display	17-inch (viewable) widescreen TFT active-matrix LCD, 1440 x 900 pixels, millions of colors		20-inch (viewable) widescreen TFT active-matrix LCD, 1680 x 1050 pixels, millions of colors	24-inch (viewable) widescreen TFT active-matrix LCD, 1920 x 1200 pixels, millions of colors
Video	Built-in iSight; Mini-DVI output port with support for DVI, VGA, S-video, and composite video connections via adapter <sup>(4)</sup>			
Graphics	Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory	ATI Radeon X1600 with 128MB GDDR3 SDRAM		NVIDIA GeForce 7300GT with 128MB GDDR3 SDRAM
FireWire	Two FireWire 400 ports; 8 watts shared			One FireWire 400 and one FireWire 800 port; 15 watts shared
USB	Three USB 2.0 ports; two USB 1.1 ports (on keyboard)			
Audio	Built-in stereo speakers, built-in microphone, optical digital audio output/headphone out, optical digital audio input/audio line in			
Ethernet	Built-in 10/100/1000BASE-T (Gigabit)			
Wireless	Built-in 54 Mbps AirPort Extreme (802.11g) <sup>3</sup>	Built-in 54 Mbps AirPort Extreme (802.11g) <sup>3</sup> ; built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module.		
Hardware accessories	Apple Keyboard and Mighty Mouse	Apple Remote, Apple Keyboard, and Mighty Mouse		
Other	Built-in IR Receiver			Built-in IR Receiver, optional VESA mount adapter kit
Configure-to-Order Options		2GB Memory Upgrade (2x1GB)		2GB Memory Upgrade (2x1GB)
		3GB Memory Upgrade (1x1GB, 1x2GB)		3GB Memory Upgrade (1x1GB, 1x2GB)
Configure-to-Order Options	1GB Memory Upgrade (2x512MB)	2.16GHz Core 2 Duo	2GB Memory Upgrade (2x1GB)	2GB Memory Upgrade (2x1GB)
	2GB Memory Upgrade (2x1GB)	250 or 500GB HD	3GB Memory Upgrade (1x1GB, 1x2GB)	3GB Memory Upgrade (1x1GB, 1x2GB)
	Apple Remote	Apple Wireless Keyboard/Mighty Mouse	2.33GHz Core 2 Duo	2.33GHz Core 2 Duo
	Apple USB Modem	Apple USB Modem	500GB HD	500GB Hard Drive
	Software: iWork '06	Software: iWork '06, Aperture, Logic Express, Final Cut Express	256MB VRAM	NVIDIA 7600 GT with 256MB VRAM
			Apple Wireless Keyboard/Mighty Mouse	Apple Wireless Keyboard/Mighty Mouse
			Apple USB Modem	Apple USB Modem
			Software: iWork '06, Aperture, Logic Express, Final Cut Express	Software: iWork '06, Aperture, Logic Express, Final Cut Express
Limited warranty and service	Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.			

## Accessories

- AirPort Express Base Station
- AirPort Extreme Base Station
- Apple 8x DVD-R Media Kit
- Apple mini-DVI to DVI Adapter

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- Apple mini-DVI to VGA Adapter
- Apple mini-DVI to Video Adapter
- Apple FireWire Cable
- AppleCare Protection Plan
- iMac 24-inch VESA Mount Adapter

## Software

- iWork
- Aperture
- Logic Express
- Final Cut Express

## In the Box

- iMac
- Apple Keyboard
- Mighty Mouse
- Apple Remote<sup>(1)</sup>
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

## Processor and memory

- 1.83GHz, 2.0GHz, 2.16GHz or 2.33GHz Intel Core 2 Duo processor
- 4MB shared L2 cache at full processor speed on iMac with 2.0GHz, 2.16GHz, or 2.33GHz Intel Core 2 Duo processor
- 2MB shared L2 cache at full processor speed on iMac with 1.83GHz Intel Core 2 Duo processor
- 667MHz system bus
- 17-inch model with 1.83GHz processor
  - 512MB (2x256MB) of PC2-5300 (667MHz) DDR2 memory
  - Two SODIMM slots support up to 2GB
- 17-inch model with 2.0GHz processor, 20-inch and 24-inch models
  - 1GB (2x512MB) of PC2-5300 (667MHz) DDR2 memory
  - Two SODIMM slots support up to 3GB

## Storage

- 17-inch model
  - 160GB Serial ATA 7200-rpm hard drive
  - Optional 250- and 500GB Serial ATA 7200-rpm hard drives on model with 2.0GHz processor
- 20-inch and 24-inch models
  - 250GB Serial ATA 7200-rpm hard drive <sup>(2)</sup>
  - Optional 500GB Serial ATA 7200-rpm hard drive
- 17-inch model with 1.83GHz processor with slot-loading 24x Combo drive (DVD-ROM/CD-RW)
  - Reads DVDs at up to 8x speed
  - Writes CD-R discs at up to 24x speed
  - Writes CD-RW discs at up to 16x speed
  - Reads CDs at up to 24x speed
- 17-inch model with 2.0GHz processor, 20-inch model and 24-inch model with slot-loading 8x SuperDrive (DVD+R DL/DVD±RW/CD-RW)
  - Writes DVD+R DL discs at up to 2.4x speed
  - Writes DVD-R and DVD+R discs at up to 8x speed
  - Writes DVD-RW and DVD+RW discs at up to 4x speed
  - Reads DVDs at up to 8x speed
  - Writes CD-R discs at up to 24x speed
  - Writes CD-RW discs at up to 16x speed
  - Reads CDs at up to 24x speed

## Communications

- Built-in 54-Mbps AirPort Extreme Card (802.11g standard) <sup>(3)</sup>
- Built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module <sup>(1)</sup>
- Built-in 10/100/1000 BASE-T Gigabit Ethernet (RJ-45 connector)
- Works with 56K V.92 Apple USB Modem (sold separately)

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## Display

- Built-in 17-inch (viewable), 20-inch (viewable), or 24-inch (viewable) widescreen TFT active-matrix liquid crystal display
- Millions of colors at all resolutions
- Typical viewing angle:
  - 17-inch model
    - 140° horizontal
    - 120° vertical
  - 20-inch model
    - 170° horizontal
    - 170° vertical
  - 24-inch model
    - 178° horizontal
    - 178° vertical
- Typical brightness: 250 cd/m (17-inch model); 280 cd/m (20-inch model); 400 cd/m (24-inch model)
- Typical contrast ratio: 500:1 (17-inch model); 800:1 (20-inch model); 700:1 (24-inch model)

## Graphics and Video

- 17-inch model with 1.83GHz processor
  - Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory
- 17-inch model with 2.0GHz processor and 20-inch model
  - ATI Radeon X1600 graphics processor using PCI Express
  - 128MB of GDDR3 SDRAM
  - Optional 256MB of GDDR3 SDRAM on 20-inch model
- 24-inch model
  - NVIDIA GeForce 7300 GT graphics processor with 128MB of GDDR3 SDRAM using PCI Express
  - Optional NVIDIA GeForce 7600 GT graphics processor with 256MB of GDDR3 SDRAM using PCI Express
- Mini-DVI output port with support for DVI, VGA, S-video, and composite video connections via adapter<sup>(4)</sup>
- Built-in iSight camera
- Support for external display in extended desktop
  - Digital resolutions up to 1920 x 1200
  - Analog resolutions up to 2048 x 1536
- Support for external display in video mirroring mode

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 180W (17- and 20-inch models); 220W (24-inch model)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Size and weight (17-inch)

- Height: 16.9 inches (43.0 cm)
- Width: 16.8 inches (42.6 cm)
- Depth: 6.8 inches (17.3 cm)
- Weight: 15.5 pounds (7 kg)<sup>(5)</sup>

## Size and weight (20-inch)

- Height: 18.6 inches (47.2 cm)
- Width: 19.4 inches (49.3 cm)
- Depth: 7.4 inches (18.9 cm)
- Weight: 22 pounds (10 kg)<sup>(5)</sup>

## Size and weight (24-inch)

- Height: 20.6 inches (52.3 cm)
- Width: 22.6 inches (57.4 cm)
- Depth: 8.1 inches (20.7 cm)
- Weight: 24.7 pounds (11.2 kg)<sup>(5)</sup>

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## Peripheral connections

- 17-inch and 20-inch models
  - Two FireWire 400 ports; 8 watts shared
- 24-inch model
  - One FireWire 400 and one FireWire 800 port; 15 watts shared
- Total of five USB ports: three USB 2.0 ports (up to 480 Mbps) on computer, two USB 1.1 ports on keyboard

## Audio

- Built-in stereo speakers
- 17-inch and 20-inch models
  - Internal 12-watt digital amplifier
- 24-inch model
  - Internal 24-watt digital amplifier
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork (30-day trial), Big Bang Board Games, Comic Life, Omni Outliner, and Apple Hardware Test
- Front Row
- Photo Booth

- 
1. Not included with 17-inch iMac with a 1.83GHz processor.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Wireless Internet access requires AirPort Express or AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.
  4. Requires adapter, sold separately.
  5. Weight varies by configuration and manufacturing process.

Intel and Intel Core are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.  
Internet access requires a compatible Internet service provider; fees may apply.  
Product contains electronic documentation.  
Backup copy of software is included.

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# Macintosh Performa 636 and 636CD: Technical Specifications

Macintosh Performa 636 and 636CD

Logic Board		Ports		Power	
Processor:	68LC040, 66	USB:		Max Watts:	45
PMMU:	integrated	ADB:		Amps:	1.25
FPU:	none	Video:		BTU per Hr:	153.9
Data Path:	32, 33	Floppy:		Voltage:	100-240
L1 Cache:	8K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	4.5V alkaline
2nd Processor:	none	Ethernet:		Soft Power:	yes
Slots:	LC, comm., TV, video in	FireWire:			
		Mic Type:		PlainTalk	
		AirPort Ready:			
		Other Ports:		Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 1MB DRAM (built in)		
RAM Slots:	1, 72-pin SIMM				
Min - Max RAM:	4 MB - 36 MB	512 x 384	16-bit		
Min RAM Speed:	80	640 x 400	n/a-bit		
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	640 x 480	16-bit		
Install in Groups of:	1	800 x 600	8-bit		
		832 x 624	8-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	7/1/1994	Addressing Modes:		Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:		Floppy Inject:	manual
Form Factor:	Quadra 630	Orig Enabler:		Min. Int HD Size:	250MB
Gestalt ID:	98	ROM ID:		Int HD Interface:	IDE
Weight (lbs):	19	ROM Ver:		Orig CD Speed	2x
Dimensions (in):	4.3 H x 12.6 W x 16.5 D	ROM Size:		Int CD Support:	yes
		AppleTalk Ver:			
		Mac OS			
		Supported:			
			7.1.2P		
			7.5		
			7.5.1		
			7.5.3		
			7.5.5		
			7.6		
			7.6.1		
			8.0		
			8.1		

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# Macintosh Performa 637CD: Technical Specifications

Macintosh Performa 637CD

Logic Board		Ports		Power	
Processor:	68LC040, 66	USB:		Max Watts:	45
PMMU:	integrated	ADB:		Amps:	1.25
FPU:	none	Video:		BTU per Hr:	153.9
Data Path:	32, 33	Floppy:		Voltage:	100-240
L1 Cache:	8K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	4.5V alkaline
2nd Processor:	none	Ethernet:		Soft Power:	yes
Slots:	LC, comm., TV, video in	FireWire:			
		Mic Type:		PlainTalk	
		AirPort Ready:			
		Other Ports:		Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 1MB DRAM (built in)		
RAM Slots:	1, 72-pin SIMM				
Min - Max RAM:	8 MB - 36 MB	512 x 384	16-bit		
Min RAM Speed:	80	640 x 400	n/a-bit		
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	640 x 480	16-bit		
Install in Groups of:	1	800 x 600	8-bit		
		832 x 624	8-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	7/1/1994	Addressing Modes:		Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:		Floppy Inject:	manual
Form Factor:	Quadra 630	Orig Enabler:		Min. Int HD Size:	350MB
Gestalt ID:	98	ROM ID:		Int HD Interface:	IDE
Weight (lbs):	19	ROM Ver:		Orig CD Speed	2x
Dimensions (in):	4.3 H x 12.6 W x 16.5 D	ROM Size:		Int CD Support:	yes
		AppleTalk Ver:			
		Mac OS			
		Supported:			
			7.1.2P		
			7.5		
			7.5.1		
			7.5.3		
			7.5.5		
			7.6		
			7.6.1		
			8.0		
			8.1		

Published Date: Jul 25, 2017

# Macintosh Performa 638CD: Technical Specifications

Macintosh Performa 638CD

Logic Board		Ports		Power	
Processor:	68LC040, 66	USB:		Max Watts:	45
PMMU:	integrated	ADB:		Amps:	1.25
FPU:	none	Video:		BTU per Hr:	153.9
Data Path:	32, 33	Floppy:		Voltage:	100-240
L1 Cache:	8K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	4.5V alkaline
2nd Processor:	none	Ethernet:		Soft Power:	yes
Slots:	LC, comm., TV, video in	FireWire:			
		Mic Type:		PlainTalk	
		AirPort Ready:			
		Other Ports:		Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory		Video Memory			
Logic Board:	4 MB	Resolution      Video Memory 1MB DRAM (built in)			
RAM Slots:	1, 72-pin SIMM	512 x 384	16-bit		
Min - Max RAM:	8 MB - 36 MB	640 x 400	n/a-bit		
Min RAM Speed:	80	640 x 480	16-bit		
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	800 x 600	8-bit		
Install in Groups of:	1	832 x 624	8-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	
Introduced:	7/1/1994	Addressing Modes:		Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:		Floppy Inject:	manual
Form Factor:	Quadra 630	Orig Enabler:		Min. Int HD Size:	350MB
Gestalt ID:	98	ROM ID:		Int HD Interface:	IDE
Weight (lbs):	19	ROM Ver:		Orig CD Speed	2x
Dimensions (in):	4.3 H x 12.6 W x 16.5 D	ROM Size:		Int CD Support:	yes
		AppleTalk Ver:			
		Mac OS Supported:			
			7.1.2P		
			7.5		
			7.5.1		
			7.5.3		
			7.5.5		
			7.6		
			7.6.1		
			8.0		

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# Macintosh Performa 640CD DOS Compatible:Technical Specifications

Macintosh Performa 640CD DOS Compatible

Logic Board		Ports		Power	
Processor:	68LC040, 66	USB:		Max Watts:	45
PMMU:	integrated	ADB:	1	Amps:	1.25
FPU:	none	Video:	DB-15	BTU per Hr:	153.9
Data Path:	32, 33	Floppy:	none	Voltage:	100-240
L1 Cache:	8K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	none	Geoports:		Battery Type:	4.5V alkaline
2nd Processor:	486DX2, 66 MHz	Ethernet: none		Soft Power:	yes
Slots:	Comm., TV, video in	FireWire:			
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,Headphone ,Remote Control ,		
		Port Notes:	PC game port also available.		
		Sound Notes:	Comes with Sound Blaster 16-compatible expansion card.>		
Memory		Video Memory			
Logic Board:	4 MB	Resolution	Video Memory 1MB DRAM (built in)		
RAM Slots:	2, 72-pin SIMM	512 x 384	16-bit		
Min - Max RAM:	8 MB - 52 MB	640 x 400	n/a-bit		
Min RAM Speed:	80	640 x 480	16-bit		
RAM Sizes:	1, 2, 4, 8, 16, 32 MB	800 x 600	8-bit		
Install in Groups of:	1	832 x 624	8-bit		
Notes:	Second SIMM slot can accept only 1, 4, or 16MB SIMMs. DOS card can accept one 72-pin SIMM (◆ 80 ns), up to 32MB in size -- comes with 4MB SIMM installed.	1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
		Notes: Video in not supported at 832x624.			
Physical		Software		Storage	

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Introduced:	5/1/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.1	Floppy Inject:	manual
Form Factor:	Quadra 630	Orig Enabler:	none	Min. Int HD Size:	500MB
Gestalt ID:	98	ROM ID:	\$067C	Int HD Interface:	IDE
Weight (lbs):	19	ROM Ver:	\$32	Orig CD Speed:	2x
Dimensions (in):	4.3 H x 12.6 W x 16.5 D	ROM Size:	1MB	Int CD Support:	yes
		AppleTalk Ver:	58.1.3		
		Mac OS Supported:	7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0		
		Notes:	Includes Microsoft MS-DOS 6.22 and Windows 3.1.		

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# Macintosh Performa 5200CD:Technical Specifications

Macintosh Performa 5200CD

Logic Board	Ports	Power
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm., TV, video in/out	USB: ADB: 1 Video: opt. DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound Notes: Some systems have 8-bit sound. INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	Max Watts: 125 Amps: 4 BTU per Hr: 427.5 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	ResolutionVideo Memory1MB DRAM (built in) 512 x 384n/a-bit 640 x 400n/a-bit 640 x 48016-bit 800 x 6008-bit 832 x 6248-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 5/1/1995 Discontinued: n/a Form Factor: PM 5200 Gestalt ID: 41 Weight (lbs): 47 Dimensions (in): 17.5 H x 15.1 W x 16 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 500MB-1GB Int HD Interface: IDE Orig CD Speed: 2x, 4x Int CD Support: yes

# Macintosh Performa 5210CD:Technical Specifications

Macintosh Performa 5210CD

Logic Board	Ports	Power
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm., TV, video in/out	USB: ADB: 1 Video: opt. DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer, Modem, Speaker, Headphone, Remote Control, / Sound Notes: Some systems have 8-bit sound. INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	Max Watts: 125 Amps: 4 BTU per Hr: 427.5 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	ResolutionVideo Memory1MB DRAM (built in) 512 x 384n/a-bit 640 x 400n/a-bit 640 x 48016-bit 800 x 6008-bit 832 x 6248-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 5/1/1995 Discontinued: n/a Form Factor: PM 5200 Gestalt ID: 41 Weight (lbs): 47 Dimensions (in): 17.5 H x 15.1 W x 16 D Notes: This system is not sold in the U.S.	Addressing Modes: 32-bit Orig SSW: J-7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1, 7.5.3, 7.5.5, 7.6, 7.6.1, 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 500MB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# Macintosh Performa 5215CD:Technical Specifications

Macintosh Performa 5215CD

Logic Board	Ports	Power
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm., TV, video in/out	USB: ADB: 1 Video: opt. DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms> Notes:	Max Watts: 125 Amps: 4 BTU per Hr: 427.5 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	Resolution Video Memory 1MB DRAM (built in) 512 x 384 n/a-bit 640 x 400 n/a-bit 640 x 480 16-bit 800 x 600 8-bit 832 x 624 8-bit 1024 x 768 n/a-bit 1152 x 870 n/a-bit 1280 x 1024 n/a-bit Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 7/17/1995 Discontinued: n/a Form Factor: PM 5200 Gestalt ID: 41 Weight (lbs): 47 Dimensions (in): 17.5 H x 15.1 W x 16 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# Macintosh Performa 5220CD:Technical Specifications

Macintosh Performa 5220CD

Logic Board	Ports	Power
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm., TV, video in/out	USB: ADB: 1 Video: opt. DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer, Modem, Speaker, Headphone, Remote Control, / Sound Notes: Some systems have 8-bit sound. INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	Max Watts: 125 Amps: 4 BTU per Hr: 427.5 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	ResolutionVideo Memory1MB DRAM (built in) 512 x 384n/a-bit 640 x 400n/a-bit 640 x 48016-bit 800 x 6008-bit 832 x 6248-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 5/1/1995 Discontinued: n/a Form Factor: PM 5200 Gestalt ID: 41 Weight (lbs): 47 Dimensions (in): 17.5 H x 15.1 W x 16 D Notes: This system is not sold in the U.S.	Addressing Modes: 32-bit Orig SSW: J-7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1, 7.5.3, 7.5.5, 7.6, 7.6.1, 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 500MB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# Macintosh Performa 5260CD:Technical Specifications

Macintosh Performa 5260CD

Logic Board	Ports	Power
Processor: 603e, 100	USB:	Max Watts: 125
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: opt. DB-15	BTU per Hr: 427.5
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: LC, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
	Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	
	Notes:	
Memory	Video Memory	
Logic Board: none	Resolution Video Memory 1MB DRAM (built in)	
RAM Slots: 2, 72-pin SIMM	512 x 384 n/a-bit	
Min - Max RAM: 8 MB - 64 MB	640 x 400 n/a-bit	
Min RAM Speed: 80	640 x 480 16-bit	
RAM Sizes: 4, 8, 16, 32 MB	800 x 600 n/a-bit	
Install in Groups of: 1	832 x 624 n/a-bit	
	1024 x 768 n/a-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
Physical	Software	Storage
Introduced: 4/15/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: none	Min. Int HD Size: 800MB
Gestalt ID: 41	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 45	ROM Ver: n/a	Orig CD Speed: 4x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0	

# Macintosh Performa 5260/120: Technical Specifications

Macintosh Performa 5260/120

Logic Board	Ports	Power
Processor: 603e, 120	USB:	Max Watts: 125
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: opt. DB-15	BTU per Hr: 427.5
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: LC, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 64 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 10/1/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: none	Min. Int HD Size: 1.2GB
Gestalt ID: 41	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 45	ROM Ver: n/a	Orig CD Speed: 8x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0	

Published Date: Jul 25, 2017



# Mac mini (Late 2006) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Mac mini (Late 2006) - Technical Specifications

	1.66GHz Mac mini (MA607LL/A)	1.83GHz Mac mini (MA608LL/A)
Processor	1.66GHz Intel Core Duo	1.83GHz Intel Core Duo
L2 Cache	2MB Shared	
System bus	667MHz	
Memory	512MB of 667MHz DDR2 SDRAM (PC2-5300), supports up to 2GB	
Hard drive	60GB 5400-rpm Serial ATA <sup>(2)</sup>	80GB 5400-rpm Serial ATA
Optical drive	Slot-loading Combo drive (DVD-ROM/CD-RW)	Slot-loading SuperDrive with double-layer support (DVD+R DL/DVD±RW/CD-RW)
Graphics	Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory <sup>(1)</sup>	
Ports	One FireWire 400 port (8 watts); Four USB 2.0 ports (up to 480 Mbps); DVI output; VGA output (using included adapter); S-video and composite video output <sup>(4)</sup>	
Audio	Built-in speakers, combined optical digital audio input/audio line in, combined optical digital audio output/headphone out	
Networking	Built-in 10/100/1000BASE-T (Gigabit)	
Wireless	Built-in 54-Mbps AirPort Extreme Wi-Fi (802.11g) <sup>(3)</sup> ; built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module.	
Limited warranty and service	Your Mac mini comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	

### Configure to Order

- 80 GB hard drive (1.66GHz only)
- 120 GB hard drive
- 160 GB hard drive
- Up to 2GB of 667MHz DDR2 SDRAM
- Apple Wireless Keyboard(M9270LL/A)
- Apple Wireless Mighty Mouse(M9269Z/A)
- Apple USB Modem (MA034Z/A)

### Accessories

- AirPort Express Base Station (M9470LL/A)
- AirPort Extreme Base Station (M8799LL/A)
- Apple 8x DVD-R Media Kit (M9472G/A)
- Apple DVI to Video Adapter (M9267G/A)
- Apple FireWire Cable (M8706G/A)
- AppleCare Protection Plan (MA514LL/A)
- .Mac Subscription (M9888Z/A)
- iWork (MA222Z/A)

### In the Box

- Mac mini
- Apple Remote
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

### Processor and memory

- 1.66GHz or 1.83 Intel Core Duo processor
- 2MB on-chip L2 cache
- 667MHz frontside bus
- 512MB of 667MHz DDR2 SDRAM (PC2-5300) on two DIMMs; supports up to 2GB

### Size and weight

- Height: 2 inches (5.08 cm)
- Width: 6.5 inches (16.51 cm)

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- Depth: 6.5 inches (16.51 cm)
- Weight: 2.9 pounds (1.31 kg)

## Peripheral connections

- One FireWire 400 port (8 watts)
- Four USB 2.0 ports (up to 480 Mbps)

## Graphics and Video Support

- Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory<sup>(1)</sup>
- DVI video output to support digital resolutions up to 1920 by 1200 pixels; supports 20-inch Apple Cinema Display and 23-inch Apple Cinema HD Display; supports coherent digital displays up to 154MHz; supports noncoherent digital displays up to 135MHz
- VGA video output (using included adapter) to support analog resolutions up to 1920 by 1080 pixels
- S-video and composite video output to connect directly to a TV or projector (using Apple DVI to Video Adapter, sold separately)

## Communications

- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard)
- Built-in Bluetooth 2.0 + Enhanced Data Rate (EDR) up to 3 Mbps
- Optional external Apple USB Modem

## Audio

- Built-in speaker
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)

## Storage

- 60GB or 80GB 5400-rpm Serial ATA hard disk drive; optional 120GB or 160GB drive<sup>(2)</sup>
- One of the following optical drives:
  - Slot-loading Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed
  - Slot-loading SuperDrive with double-layer support (DVD+R DL/DVD±RW/CD-RW): writes DVD+R DL discs at up to 2.4x speed, writes DVD-R and DVD+R discs at up to 8x speed, writes DVD-RW and DVD+RW discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 110W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork (30-day trial), Big Bang Board Games, Comic Life, Omni Outliner, and Apple Hardware Test
- Front Row

1. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 80MB, resulting in 432MB of system memory available.

2. 1GB = 1 billion bytes; actual formatted capacity less.

3. Wireless Internet access requires AirPort Express or AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.

4. Requires Apple DVI to Video Adapter, sold separately

Intel and Intel Core are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Internet access requires a compatible Internet service provider; fees may apply.

Product contains electronic documentation.

Backup copy of software is included.

Published Date: Apr 6, 2016

# iPhone - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

- Height: 4.5 inches (115 mm)
- Width: 2.4 inches (61 mm)
- Depth: 0.46 inch (11.6 mm)
- Weight: 4.8 ounces (135 grams)

## In the box

- iPhone
- Stereo Headset
- Dock
- Dock Connector to USB Cable
- USB Power Adapter
- Documentation
- Cleaning/polishing cloth

## Capacity

- 8GB or 16GB flash drive<sup>1</sup>

## Display

- 3.5-inch (diagonal) widescreen Multi-Touch display
- 480-by-320-pixel resolution at 163 ppi
- Support for display of multiple languages and characters simultaneously

## Operating system

- iOS

## GSM

- Quad-band (850, 900, 1800, 1900 MHz)

## Wireless data

- Wi-Fi (802.11b/g)
- EDGE
- Bluetooth 2.0+EDR

## Camera

- 2.0 megapixels

## Audio

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC, Protected AAC, MP3, MP3 VBR, Audible (formats 1, 2, and 3), Apple Lossless, AIFF, and WAV

## Video

- Video formats supported: H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 768 Kbps, 320 by 240 pixels, 30 frames per second, Baseline Profile up to Level 1.3 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

## Headphones

## 2\_iPhone - Technical Specifications.pdf

- Stereo earphones with built-in microphone
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

### Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.10 or later
- iTunes 7.5 or later

### Windows system requirements

- PC with USB 2.0 port
- Windows Vista Home Premium, Business, Enterprise, or Ultimate Edition; or Windows XP Home or Professional with Service Pack 2 or later
- iTunes 7.5 or later

### Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

### Input and output

- iPhone
  - 30-pin dock connector
  - 3.5-mm stereo headphone minijack
- iPhone Dock
  - Dock connector

### Power and battery

- Built-in rechargeable lithium ion battery
- Talk time: Up to 8 hours<sup>2</sup>
- Standby time: Up to 250 hours<sup>3</sup>
- Internet use: Up to 6 hours<sup>4</sup>
- Video playback: Up to 7 hours<sup>5</sup>
- Audio playback: Up to 24 hours<sup>6</sup>

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Talk Time: Testing conducted by Apple in May and June 2007 using preproduction iPhone units and software. All talk time testing was done connected to a 1900MHz network. All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks was turned off. Battery life depends on the cellular network, location, signal strength, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.
  3. Standby Time: Testing conducted by Apple in May and June 2007 using preproduction iPhone units and software. All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks was turned off. Battery life depends on the cellular network, location, signal strength, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.
  4. Internet over Wi-Fi: Testing conducted by Apple in May and June 2007 using preproduction iPhone units and software. Internet over Wi-Fi testing conducted using a closed network and dedicated web and mail server, simulating browsing to 20 popular URLs and checking mail once an hour. All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; WPA2 encryption was enabled. Battery life depends on the cellular network, location, signal strength, Wi-Fi connectivity, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary. Internet over EDGE: Testing conducted by Apple in May and June 2007 using preproduction iPhone units and software. Internet over EDGE testing conducted over a 1900MHz EDGE, using a dedicated web and mail server, simulating browsing to 20 popular URLs and checking mail once an hour. All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off. Battery life depends on the cellular network, location, signal strength, EDGE connectivity, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.
  5. Video Playback: Testing conducted by Apple in May and June 2007 using preproduction iPhone units and software. Video content was a repeated 2 hour 23 minute movie purchased from the iTunes Store. All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off. Battery life depends on the cellular network, location, signal

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strength, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.

6. Audio Playback: Testing conducted by Apple in May and June 2007 using preproduction iPhone units and software. The playlist consisted of 358 unique audio tracks, a combination of content imported from CDs using iTunes (128-Kbps AAC encoding) and content purchased from the iTunes Store (128-Kbps AAC encoding). All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks was turned off. Battery life depends on the cellular network, location, signal strength, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.

Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

Published Date: Apr 11, 2016

# Power Macintosh 4400/160: Technical Specifications

## Power Macintosh 4400/160

Logic Board		Ports		Power	
Processor:	603e, 160	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 40	Floppy:	none	Voltage:	110/220
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	opt'l.	Geoports:	2	Battery Type:	4.5V alkaline
2nd Processor:	none	Ethernet:	none	Soft Power:	yes
Slots:	3 PCI	FireWire:			
Notes:	Supports one 7-inch and two 12-inch PCI slots.	Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 1MB DRAM (1x1MB)	Video Memory 2MB DRAM (1x2MB)	Video Memory 4MB DRAM (1x4MB)
RAM Slots:	3, 168-pin DIMM	512 x 384	16-bit	24-bit	24-bit
Min - Max RAM:	16 M B - 96 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	60	640 x 480	16-bit	24-bit	24-bit
RAM Sizes:	8, 16, 32 MB	800 x 600	16-bit	24-bit	24-bit
Install in Groups of:	1	832 x 624	16-bit	24-bit	24-bit
Notes:	Uses JEDEC-standard 3.3-volt unbuffered EDO DIMM devices. DRAM slot 1 supports only single-bank DIMMs.	1024 x 768	8-bit	16-bit	24-bit
		1152 x 870	8-bit	16-bit	16-bit
		1280 x 1024	n/a-bit	8-bit	16-bit
		Notes: Can use EDO DRAM, SGRAM, or SDRAM for video expansion.			
Physical		Software		Storage	
Introduced:	11/7/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PM 4400	Orig Enabler:	System Enabler 827	Min. Int HD Size:	1.2GB
Gestalt ID:	514	ROM ID:	\$077D	Int HD Interface:	ATA
Weight (lbs):	24	ROM Ver:	\$37	Orig CD Speed	8x
Dimensions (in):	5.43 H x 15.12 W x 17.37 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	60.1.1		
		Mac OS Supported:	7.5.3 7.6 7.6.1 8.0 8.5 8.1 8.6 9		

# Power Macintosh 4400/200: Technical Specifications

## Power Macintosh 4400/200

Logic Board		Ports		Power	
Processor:	603e, 200	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 40	Floppy:	none	Voltage:	110/220
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	256K	Geoports:	2	Battery Type:	4.5V alkaline
2nd Processor:	none	Ethernet:	10baseT	Soft Power:	yes
Slots:	2 PCI, comm II	FireWire:			
Notes:	Supports one 7-inch and one 12-inch PCI slot.	Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB EDO DRAM (1x2MB)	Video Memory 4MB SGRAM (1x4MB)	
RAM Slots:	3, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	16 MB - 160 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	60	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	16-bit	24-bit	
Notes:	Uses JEDEC-standard 3.3-volt unbuffered EDO DIMM devices. DRAM slot 1 supports only single-bank DIMMs.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	16-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	2/17/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PM 4400	Orig Enabler:	System Enabler 827	Min. Int HD Size:	2GB
Gestalt ID:	515	ROM ID:	\$077D	Int HD Interface:	ATA
Weight (lbs):	24	ROM Ver:	\$3A	Orig CD Speed	8x
Dimensions (in):	5.43 H x 15.12 W x 17.37 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.1		
		Mac OS Supported:	7.5.3 7.6.1 8.0 8.1 8.5 8.6 9		

# Power Macintosh 4400/200 PC Compatible: Technical Specifications

## Power Macintosh 4400/200 PC Compatible

Logic Board	Ports	Power
Processor: 603e, 200	USB:	Max Watts: 150
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 513
Data Path: 64, 40	Floppy: none	Voltage: 110/220
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: Cyrix P166 6x86	Ethernet: 10baseT	Soft Power: yes
Slots: 2 PCI, comm II	FireWire:	
Notes: Supports one 7-inch and one 12-inch PCI slot. The 12-inch PCI slot is occupied by the PC Compatibility card.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker	
	Port Notes: Includes PC game port on PC Compatibility card.	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB EDO DRAM (1x2MB) Video Memory 4MB SGRAM (1x4MB)
RAM Slots: 3, 168-pin DIMM	512 x 384	24-bit 24-bit
Min - Max RAM: 32 MB - 160 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 60	640 x 480	24-bit 24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit 24-bit
Install in Groups of: 1	832 x 624	16-bit 24-bit
Notes: Uses JEDEC-standard 3.3-volt unbuffered EDO DIMM devices. DRAM slot 1 supports only single-bank DIMMs.	1024 x 768	16-bit 24-bit
	1152 x 870	16-bit 16-bit
	1280 x 1024	8-bit 16-bit
Physical	Software	Storage
Introduced: 4/4/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 4400	Orig Enabler: System Enabler 827	Min. Int HD Size: 2GB
Gestalt ID: 515	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 24	ROM Ver: \$3A	Orig CD Speed: 12x
Dimensions (in): 5.43 H x 15.12 W x 17.37 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.5.3 7.6.1 8.0 8.1 8.5 8.6 9	
	Notes: Includes Windows 95 for use with PC Compatibility card.	



Published Date: Jul 26, 2017

# Power Macintosh 5200/75 LC: Technical Specifications

## Power Macintosh 5200/75 LC

Logic Board	Ports		Power	
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: opt. DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound Notes: Some systems have 8-bit sound. INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>		Max Watts: 125 Amps: 4 BTU per Hr: 427.5 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes	
Memory	Video Memory			
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	ResolutionVideo Memory 1MB DRAM (built in) 512 x 384 n/a-bit 640 x 400 n/a-bit 640 x 480 16-bit 800 x 600 8-bit 832 x 624 8-bit 1024 x 768 n/a-bit 1152 x 870 n/a-bit 1280 x 1024 n/a-bit Notes: Video in not supported at 832x624.			
Physical	Software		Storage	
Introduced: 4/3/1995 Discontinued: 4/13/1996 Form Factor: PM 5200 Gestalt ID: 41 Weight (lbs): 47 Dimensions (in): 17.5 H x 15.1 W x 16 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 500MB Int HD Interface: IDE Orig CD Speed: 2x Int CD Support: yes	

# Power Macintosh 5260/100: Technical Specifications

## Power Macintosh 5260/100

Logic Board	Ports	Power
Processor: 603e, 100	USB:	Max Watts: 125
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: opt. DB-15	BTU per Hr: 427.5
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: LC, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
	Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	
	Notes:	
Memory	Video Memory	
Logic Board: none	Resolution Video Memory	
RAM Slots: 2, 72-pin SIMM	1MB DRAM (built in)	
Min - Max RAM: 16 MB - 64 MB	512 x 384 n/a-bit	
Min RAM Speed: 80	640 x 400 n/a-bit	
RAM Sizes: 4, 8, 16, 32 MB	640 x 480 16-bit	
Install in Groups of: 1	800 x 600 n/a-bit	
	832 x 624 n/a-bit	
	1024 x 768 n/a-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
Physical	Software	Storage
Introduced: 4/15/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: none	Min. Int HD Size: 800MB
Gestalt ID: 41	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 45	ROM Ver: n/a	Orig CD Speed: 4x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	

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Published Date: Jul 26, 2017

# Power Macintosh 5260/120: Technical Specifications

## Power Macintosh 5260/120

Logic Board	Ports	Power
Processor: 603e, 120	USB:	Max Watts: 125
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: opt. DB-15	BTU per Hr: 427.5
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: LC, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 64 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 10/1/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: none	Min. Int HD Size: 1.2GB
Gestalt ID: 41	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 45	ROM Ver: n/a	Orig CD Speed 8x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	

# Power Macintosh 5300/100 LC: Technical Specifications

## Power Macintosh 5300/100 LC

Logic Board	Ports	Power
Processor: 603e, 100 PMMU: integrated FPU: integrated Data Path: 64, 40 L1 Cache: 32K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: opt. DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms> Notes:	Max Watts: 125 Amps: 4 BTU per Hr: 427.5 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 16 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	Video Memory Resolution1MB DRAM (built in) 512 x 384n/a-bit 640 x 400n/a-bit 640 x 48016-bit 800 x 6008-bit 832 x 6248-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 8/28/1995 Discontinued: n/a Form Factor: PM 5200 Gestalt ID: 41 Weight (lbs): 47 Dimensions (in): 17.5 H x 15.1 W x 16 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6.1 8.0 7.6 8.5 8.1 8.6 9	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1.2GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

Published Date: Jul 26, 2017

# Power Macintosh 5400/120: Technical Specifications

## Power Macintosh 5400/120

Logic Board	Ports	Power
Processor: 603e, 120	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatibility Card	Ethernet: 10baseT	Soft Power: yes
Slots: PCI, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 136 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	16-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	8-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 4/15/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: System Enabler 410	Min. Int HD Size: 1.6GB
Gestalt ID: 74	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 47	ROM Ver: \$29	Orig CD Speed 4x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.0	
	Mac OS Supported: 7.5.3 7.5.5 7.6.1 8.0 7.6 8.5 8.1 8.6 9	



# Power Macintosh 5400/180: Technical Specifications

## Power Macintosh 5400/180

Logic Board	Ports	Power
Processor: 603e, 180	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatibility Card	Ethernet: none	Soft Power: yes
Slots: PCI, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 136 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	16-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	8-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Video in not supported above 800x600.	
Physical	Software	Storage
Introduced: 10/1/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: System Enabler 410	Min. Int HD Size: 1.6GB
Gestalt ID: 74	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 47	ROM Ver: \$29	Orig CD Speed 8x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.1.5	
	Mac OS 7.5.3	
	Supported: 7.5.5	
	7.6	
	7.6.1	
	8.0	
	8.5	
	8.1	
	8.6	
	9	

# Power Macintosh 5400/200: Technical Specifications

## Power Macintosh 5400/200

Logic Board	Ports	Power
Processor: 603e, 200	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatibility Card	Ethernet: 10baseT	Soft Power: yes
Slots: PCI, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	n/a-bit
Min - Max RAM: 24 MB - 136 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	16-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	8-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Video in not supported above 800x600.	
Physical	Software	Storage
Introduced: 2/17/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.5	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: none	Min. Int HD Size: 1.6GB
Gestalt ID: 74	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 47	ROM Ver: n/a	Orig CD Speed: 8x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS	
	Supported:	
	7.6	
	7.5.5	
	7.6.1	
	8.0	
	8.1	
	8.5	
	8.6	
	9	

# Mac Pro - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Mac Pro - Technical Specifications

	Standard Configuration (MA356LL/A)	Build-to-Order Options
Processor	Two 2.66GHz Dual-Core Intel Xeon processors	Two 3.0GHz Quad-Core Intel Xeon processors Two 2.0GHz, 2.66GHz, or 3.0GHz Dual-Core Intel Xeon processors
Memory	1GB (two 512MB) of 667MHz DDR2 ECC fully buffered DIMM	<ul style="list-style-type: none"><li>2GB (four 512MB)</li><li>4GB (four 1GB)</li><li>8GB (eight 1GB)</li><li>8GB (four 2GB)</li><li>16GB (eight 2GB)</li></ul>
PCI Express graphics	NVIDIA GeForce 7300 GT 256MB (single-link DVI and dual-link DVI)	<ul style="list-style-type: none"><li>ATI Radeon X1900 XT 512MB (two dual-link DVI)</li><li>NVIDIA Quadro FX 4500 512MB (stereo 3D, two dual-link DVI)</li><li>Two NVIDIA GeForce 7300 GT 256MB</li><li>Three NVIDIA GeForce 7300 GT 256MB</li><li>Four NVIDIA GeForce 7300 GT 256MB</li></ul>
Hard disk drive	250GB Serial ATA 3Gb/s; 7200 rpm; 8MB cache	<ul style="list-style-type: none"><li>Hard Drive Bay 1 500GB Serial ATA 3Gb/s; 7200 rpm; 8MB cache 750GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache</li><li>Hard Drive Bay 2 500GB Serial ATA 3Gb/s; 7200 rpm; 8MB cache 750GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache</li><li>Hard Drive Bay 3 500GB Serial ATA 3Gb/s; 7200 rpm; 8MB cache 750GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache</li><li>Hard Drive Bay 4 500GB Serial ATA 3Gb/s; 7200 rpm; 8MB cache 750GB Serial ATA 3Gb/s; 7200 rpm; 16MB cache</li></ul>
Internal RAID	Optional	Mac Pro RAID card with 256MB cache and 72-hour cache battery backup <sup>4</sup>
Optical drive	16x SuperDrive with double-layer support (DVD+R DL/DVD±RW/CD-RW)	Two 16x SuperDrives with double-layer support (DVD+R DL/DVD±RW/CD-RW)
Wireless	Optional	<ul style="list-style-type: none"><li>AirPort Extreme wireless networking<sup>2</sup></li><li>Bluetooth 2.0 + EDR module</li></ul>
PCI Express	Optional	Apple Dual-Channel or Quad-Channel 4Gb Fibre Channel PCI Express Card
Displays	Optional	<ul style="list-style-type: none"><li>20-inch Apple Cinema Display (M9177LL/A)</li><li>23-inch Apple Cinema HD Display (M9178LL/A)</li><li>30-inch Apple Cinema HD Display (M9179LL/A)</li></ul>
Limited warranty and service	Your Mac Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	

### Configuration Options

- 8-core processing
  - Two 3.0GHz Quad-Core Intel Xeon 5300 series processors
- Intel Core microarchitecture
  - 8MB of L2 cache per processor (16MB total; each pair of cores shares 4MB)
  - 128-bit SSE3 vector engine
  - 64-bit data paths and registers
  - Energy efficiency optimization

# 30\_Mac Pro - Technical Specifications.pdf

- 1.33GHz, 64-bit dual independent frontside buses

## Quad-core processing

- Two 2.0GHz, 2.66GHz, or 3.0GHz Dual-Core Intel Xeon 5100 series processors
- Intel Core microarchitecture
  - 4MB of shared L2 cache per processor (8MB total)
  - 128-bit SSE3 vector engine
  - 64-bit data paths and registers
  - Energy efficiency optimization

- 1.33GHz, 64-bit dual independent frontside buses

## Memory

- 667MHz DDR2 ECC fully buffered DIMM (FB-DIMM) memory
- Eight FB-DIMM slots on two memory riser cards (four slots per card) supporting up to 16GB of main memory
- 256-bit-wide memory architecture

## Graphics and displays

- Double-wide, 16-lane PCI Express graphics slot with one of the following graphics cards installed:
  - NVIDIA GeForce 7300 GT with 256MB of GDDR2 SDRAM, one single-link DVI port, and one dual-link DVI port
  - ATI Radeon X1900 XT with 512MB of GDDR3 SDRAM and two dual-link DVI ports
  - NVIDIA Quadro FX 4500 with 512MB of GDDR3 SDRAM, two dual-link DVI ports, and one stereo 3D port
- Multiple graphics card configurations including two, three, or four NVIDIA GeForce 7300 GT cards
- 300W for up to four PCI Express graphics cards
- Support for up to eight displays<sup>1</sup>
- Support for digital resolutions up to 1920 by 1200 pixels; dual-link DVI ports support up to 2560 by 1600 pixels
- Support for analog resolutions up to 2048 by 1536 pixels
- DVI to VGA adapter included
- Dual-display support for extended desktop and video mirroring modes

## Communications

- Two independent 10/100/1000BASE-T Ethernet (RJ-45) interfaces with support for jumbo frames
- Optional 802.11n AirPort Extreme wireless networking<sup>2</sup>
- Optional Bluetooth 2.0 + Enhanced Data Rate (EDR) up to 3Mb/s
- Optional external Apple USB Modem (RJ-11)

## Storage

- Four independent 3Gb/s Serial ATA cable-free, direct-attach hard drive bays; four internal hard drive carriers included
- Up to 3TB of internal storage<sup>3</sup> using hard drives in the following capacities:
  - Hard drive bay 1
    - 250GB Serial ATA 3Gb/s, 7200 rpm, 8MB cache
    - 500GB Serial ATA 3Gb/s, 7200 rpm, 8MB cache
    - 750GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
  - Hard drive bay 2
    - 500GB Serial ATA 3Gb/s, 7200 rpm, 8MB cache
    - 750GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
  - Hard drive bay 3
    - 500GB Serial ATA 3Gb/s, 7200 rpm, 8MB cache
    - 750GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
  - Hard drive bay 4
    - 500GB Serial ATA 3Gb/s, 7200 rpm, 8MB cache
    - 750GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
- Optional Mac Pro RAID card with 256MB cache and 72-hour cache battery backup<sup>4</sup>
- 16x SuperDrive with double-layer support (DVD+R DL/DVD±RW/CD-RW)
  - Writes DVD-R discs at up to 16x speed
  - Writes DVD+R DL discs at up to 8x speed
  - Reads DVDs at up to 16x speed
  - Writes CD-R discs at up to 32x speed
  - Writes CD-RW discs at up to 24x speed
  - Reads CDs at up to 32x speed
- One open optical drive bay for optional second SuperDrive

## Electrical and environmental requirements

- ENERGY STAR configurations available<sup>5</sup>
- Line voltage: 100-120V AC or 200-240V AC (wide-range power supply input voltage)
- Frequency: 50Hz to 60Hz single phase
- Current: Maximum of 12A (low-voltage range) or 6A (high-voltage range)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Peripherals and audio

# 30\_Mac Pro - Technical Specifications.pdf

- Two FireWire 800 ports (one on front panel, one on back panel)
- Two FireWire 400 ports (one on front panel, one on back panel)
- Five USB 2.0 ports (two on front panel, three on back panel)
- Two USB 1.1 ports on included keyboard
- Front-panel headphone minijack and speaker
- Optical digital audio input and output TOSLINK ports
- Analog stereo line-level input and output minijacks

## PCI Express expansion<sup>6</sup>

- Three open full-length PCI Express expansion slots
- Configurable bandwidth and mechanical support for 16-lane cards
- 300W combined maximum for all PCI Express slots

## Software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode, Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, and GarageBand)
- Microsoft Office 2004 for Mac Test Drive, iWork '08 (30-day trial)

## Size and weight

- Height: 20.1 inches (51.1 cm)
- Width: 8.1 inches (20.6 cm)
- Depth: 18.7 inches (47.5 cm)
- Weight (standard configuration): 42.4 pounds (19.2 kg)<sup>7</sup>

## In the box

- Mac Pro
- Apple Keyboard and Mighty Mouse
- DVI to VGA adapter
- USB keyboard extension cable
- Install/restore DVDs
- Printed and electronic documentation

## Add-Ons

### Upgrades

- 1GB memory kit (MA684G/A)
- 2GB memory kit (MA685G/A)
- 4GB memory kit (MA686G/A)
- 500GB hard drive kit (MA690G/A)
- 750GB hard drive kit (MA851G/A)
- NVIDIA GeForce 7300 GT graphics card kit (MA567Z/A)
- ATI Radeon X1900 XT graphics card kit (MA631Z/A)
- Apple Dual-Channel 4Gb Fibre Channel PCI Express Card (MA462G/A)
- Apple Quad-Channel 4Gb Fibre Channel PCI Express Card (MA465G/A)

### Accessories

- AirPort Extreme Base Station (MA073LL/A)
- AirPort Express Base Station featuring iTunes (M9470LL/A)
- Apple Wireless Keyboard (M9270LL/A)
- Apple wireless Mighty Mouse (MB111LL/A)
- Apple USB Modem (MA034Z/A)
- AppleCare Protection Plan (MA516LL/A)

### Applications

- Final Cut Studio (MA285Z/A)
- Final Cut Express (MA261Z/A)
- Aperture (MA438Z/A)
- Logic Pro (MA328Z/A)
- Logic Express (MA603Z/A)
- Shake (MA434Z/A)
- Mac OS X Server v10.4 (10-client license) (MA613Z/A)
- Mac OS X Server v10.4 (Unlimited-client license) (MA612Z/A)
- Apple Remote Desktop (MA231Z/A)
- iWork '08 (MA790Z/A)

1. Requires installation of four NVIDIA GeForce 7300 GT graphics cards, each of which provides support for up to two 20-inch Apple Cinema Displays or 23-inch Apple Cinema HD Displays.
2. Wireless Internet access requires base station or other wireless access point and Internet access (fees may apply). Achieving optimal 802.11n data rates requires that all users have an 802.11n AirPort Extreme Card and connect to an 802.11n AirPort Extreme Base Station. Speed and range will be less if an 802.11a/b/g product joins the network. Actual performance will vary based on range, connection rate, site conditions, size of network, and other factors. Range will vary with site conditions. Based on IEEE 802.11n draft specification.
3. 1TB = approximately 1 trillion bytes; actual formatted capacity less.
4. Supports Mac OS X only.
5. 8-core Mac Pro systems configured with one GeForce 7300 GT graphics card and a single hard drive meet ENERGY STAR requirements. All other Mac Pro systems meet ENERGY STAR 3.0 requirements. Systems configured with an Apple Fibre Channel or Mac Pro RAID card do not comply with ENERGY STAR requirements.
6. PCI Express slots are not compatible with PCI or PCI-X expansion cards.
7. Actual weight varies by configuration and manufacturing process.

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# Power Macintosh 5500/225: Technical Specifications

## Power Macintosh 5500/225

Logic Board	Ports	Power
Processor: 603e, 225	USB:	Max Watts: 220
PMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 50	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: 10baseT	Soft Power: yes
Slots: PCI, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB SGRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 32 MB - 128 MB	640 x 400	n/a-bit
Min RAM Speed: 60	640 x 480	24-bit
RAM Sizes: 4, 8, 16, 32, 64 MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
	1024 x 768	16-bit
	1152 x 870	16-bit
	1280 x 1024	8-bit
Physical	Software	Storage
Introduced: 2/17/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.5	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: System Enabler 411	Min. Int HD Size: 2GB
Gestalt ID: 512	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 47	ROM Ver: \$35	Orig CD Speed 12x, 24x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.5.5 7.6.1 8.0 8.1 8.5 8.6 9	

# Power Macintosh 5500/250: Technical Specifications

## Power Macintosh 5500/250

Logic Board	Ports	Power
Processor: 603e, 250	USB:	Max Watts: 220
PMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 50	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: 10baseT	Soft Power: yes
Slots: PCI, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB SGRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 32 MB - 128 MB	640 x 400	n/a-bit
Min RAM Speed: 60	640 x 480	24-bit
RAM Sizes: 4, 8, 16, 32, 64MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
	1024 x 768	16-bit
	1152 x 870	16-bit
	1280 x 1024	8-bit
Physical	Software	Storage
Introduced: 9/1/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.5	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: System Enabler 411	Min. Int HD Size: 2GB
Gestalt ID: 512	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 47	ROM Ver: \$35	Orig CD Speed 24x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.5.5 7.6.1 8.0 8.1 8.5 8.6 9	

# Power Macintosh 6100/60: Technical Specifications

## Power Macintosh 6100/60

Logic Board	Ports	Power
Processor: 601, 60	USB:	Max Watts: 210
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: HDI-45	BTU per Hr: 718.2
Data Path: 64, 30	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. Intel 486DX2-66	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7⬠ NuBus or PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 8 MB - 72 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 2	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 3/14/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 1/3/1995	Orig SSW: 7.1.2	Floppy Inject: manual
Form Factor: Centris 610	Orig Enabler: PowerPC Enabler v1.0	Min. Int HD Size: 160-250MB
Gestalt ID: 75	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$A4	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.1.2 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	



# Macintosh Performa 5280: Technical Specifications

Macintosh Performa 5280

Logic Board	Ports	Power
Processor: 603e, 120	USB:	Max Watts: 125
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: opt. DB-15	BTU per Hr: 427.5
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: LC, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
	Sound Notes: INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 64 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 11/12/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: none	Min. Int HD Size: 1.2GB
Gestalt ID: 41	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 45	ROM Ver: n/a	Orig CD Speed: 8x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
Notes: This system is not sold in the U.S.	AppleTalk Ver: n/a	
	Mac OS Supported: 7.5.3	
	7.5.5	
	7.6.1	
	7.6	
	8.0	

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# Power Macintosh 6100/60AV: Technical Specifications

## Power Macintosh 6100/60AV

Logic Board	Ports	Power
Processor: 601, 60	USB:	Max Watts: 210
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: DB-15, HDI-45	BTU per Hr: 718.2
Data Path: 64, 30	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Pass Through: yes
Slots: PDS filled	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
	Port Notes: Includes S-video ports for video in and out. RCA ports available via included adapter.	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 2, 72-pin SIMM		Video Memory 2MB VRAM (built in)
Min - Max RAM: 8 MB - 72 MB	512 x 384	16-bit 24-bit
Min RAM Speed: 80	640 x 400	n/a-bit 24-bit
RAM Sizes: 4, 8, 16, 32 MB	640 x 480	16-bit 24-bit
Install in Groups of: 2	800 x 600	n/a-bit 24-bit
	832 x 624	8-bit 24-bit
	1024 x 768	n/a-bit 16-bit
	1152 x 870	n/a-bit 16-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 3/14/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 9/12/1994	Orig SSW: 7.1.2	Floppy Inject: manual
Form Factor: Centris 610	Orig Enabler: PowerPC Enabler v1.0	Min. Int HD Size: 160-250MB
Gestalt ID: 75	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$A4	Orig CD Speed: 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.1.2 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	


# Macintosh Performa 5300CD:Technical Specifications

Macintosh Performa 5300CD

Logic Board	Ports	Power																		
Processor: 603e, 100 PMMU: integrated FPU: integrated Data Path: 64, 40 L1 Cache: 32K L2 Cache: 256K 2nd Processor: none Slots: LC, comm., TV, video in/out	USB: ADB: 1 Video: opt. DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms> Notes:	Max Watts: 125 Amps: 4 BTU per Hr: 427.5 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes																		
Memory	Video Memory																			
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 16 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	<table><tr><th>Resolution</th><th>Video Memory 1MB DRAM (built in)</th></tr><tr><td>512 x 384</td><td>n/a-bit</td></tr><tr><td>640 x 400</td><td>n/a-bit</td></tr><tr><td>640 x 480</td><td>16-bit</td></tr><tr><td>800 x 600</td><td>8-bit</td></tr><tr><td>832 x 624</td><td>8-bit</td></tr><tr><td>1024 x 768</td><td>n/a-bit</td></tr><tr><td>1152 x 870</td><td>n/a-bit</td></tr><tr><td>1280 x 1024</td><td>n/a-bit</td></tr></table> Notes: Video in not supported at 832x624.	Resolution	Video Memory 1MB DRAM (built in)	512 x 384	n/a-bit	640 x 400	n/a-bit	640 x 480	16-bit	800 x 600	8-bit	832 x 624	8-bit	1024 x 768	n/a-bit	1152 x 870	n/a-bit	1280 x 1024	n/a-bit	
Resolution	Video Memory 1MB DRAM (built in)																			
512 x 384	n/a-bit																			
640 x 400	n/a-bit																			
640 x 480	16-bit																			
800 x 600	8-bit																			
832 x 624	8-bit																			
1024 x 768	n/a-bit																			
1152 x 870	n/a-bit																			
1280 x 1024	n/a-bit																			
Physical	Software	Storage																		
Introduced: 10/17/1995 Discontinued: n/a Form Factor: PM 5200 Gestalt ID: 41 Weight (lbs): 47 Dimensions (in): 17.5 H x 15.1 W x 16 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1.2GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes																		

# Power Macintosh 6100/66: Technical Specifications

## Power Macintosh 6100/66

Logic Board	Ports	Power
Processor: 601, 66	USB:	Max Watts: 210
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: HDI-45	BTU per Hr: 718.2
Data Path: 64, 33	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. Intel 486DX2-66	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7  NuBus or PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 8 MB - 72 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 2	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 1/3/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 10/14/1995	Orig SSW: 7.5	Floppy Inject: manual
Form Factor: Centris 610	Orig Enabler: PowerPC Enabler v1.1.1	Min. Int HD Size: 350-500MB
Gestalt ID: 100	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$20	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS 7.5	
	Supported: 7.5.1	
	7.5.3	
	7.5.5	
	7.6.1	
	7.6	
	8.5	
	8.0	
	8.1	
	8.6	
	9	

# Power Macintosh 6100/66AV: Technical Specifications

## Power Macintosh 6100/66AV

Logic Board		Ports		Power		
Processor:	601, 66	USB:		Max Watts:	210	
PMMU:	integrated	ADB: 1		Amps:	1.7	
FPU:	integrated	Video: DB-15, HDI-45		BTU per Hr:	718.2	
Data Path:	64, 33	Floppy: none		Voltage:	100-240	
L1 Cache:	32K	SCSI: DB-25		Freq Range:	50-60 Hz	
L2 Cache:	256K	Geoports: 2		Battery Type:	3.6V lithium	
2nd Processor:	none	Ethernet: AAUI-15		Pass Through:	yes	
Slots:	PDS filled	FireWire:				
		Mic Type: PlainTalk				
		AirPort Ready:				
		Other Ports: Printer Modem Speaker ,				
		Port Notes: Includes S-video ports for video in and out. RCA ports available via included adapter.				
Memory		Video Memory				
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)	Video Memory 2MB VRAM (built in)		
RAM Slots:	2, 72-pin SIMM	512 x 384	16-bit	24-bit		
Min - Max RAM:	8 MB - 72 MB	640 x 400	n/a-bit	24-bit		
Min RAM Speed:	80	640 x 480	16-bit	24-bit		
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	n/a-bit	24-bit		
Install in Groups of:	2	832 x 624	8-bit	24-bit		
		1024 x 768	n/a-bit	16-bit		
		1152 x 870	n/a-bit	16-bit		
		1280 x 1024	n/a-bit	n/a-bit		
Physical		Software			Storage	
Introduced:	1/3/1995	Addressing Modes:		32-bit	Floppy Size:	1.44MB
Discontinued:	4/3/1995	Orig SSW:		7.5	Floppy Inject:	manual
Form Factor:	Centris 610	Orig Enabler:		PowerPC Enabler v1.1.1	Min. Int HD Size:	350MB
Gestalt ID:	100	ROM ID:		\$077D	Int HD Interface:	SCSI
Weight (lbs):	14	ROM Ver:		\$20	Orig CD Speed	2x
Dimensions (in):	3.4 H x 16.3 W x 15.6 D	ROM Size:		4MB	Int CD Support:	yes
		AppleTalk Ver:		n/a		
		Mac OS Supported:		7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		

# Macintosh Performa 5320CD:Technical Specifications

Macintosh Performa 5320CD

Logic Board	Ports	Power
Processor: 603e, 120 PMMU: integrated FPU: integrated Data Path: 64, 40 L1 Cache: 32K L2 Cache: 256K 2nd Processor: none Slots: LC, comm., TV, video in/out	USB: ADB: 1 Video: opt. DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	Max Watts: 125 Amps: 4 BTU per Hr: 427.5 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 16 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	ResolutionVideo Memory 1MB DRAM (built in)  512 x 384n/a-bit  640 x 400n/a-bit  640 x 48016-bit  800 x 6008-bit  832 x 6248-bit  1024 x 768n/a-bit  1152 x 870n/a-bit  1280 x 1024n/a-bit  Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 11/14/1995 Discontinued: n/a Form Factor: PM 5200 Gestalt ID: 41 Weight (lbs): 47 Dimensions (in): 17.5 H x 15.1 W x 16 D Notes: This system is not sold in the U.S.	Addressing Modes: 32-bit Orig SSW: J-7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1.2GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# Macintosh Performa 5400CD:Technical Specifications

Macintosh Performa 5400CD

Logic Board	Ports	Power
Processor: 603e, 120	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatbility Card	Ethernet: 10baseT	Soft Power: yes
Slots: PCI, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 136 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	16-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	8-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 4/22/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: System Enabler 410	Min. Int HD Size: 1.6GB
Gestalt ID: 74	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 47	ROM Ver: \$29	Orig CD Speed 4x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.1.5	
	Mac OS 7.5.3	
	Supported: 7.5.5	
	7.6	
	7.6.1	
	8.0	

Published Date: Jul 25, 2017

# MacBook - Technical Specifications

This article has been archived and is no longer updated by Apple.

	1.83 GHz MacBook (MA254LL/A)	2GHz MacBook (MA255LL/A)	2GHz MacBook (MA472LL/A)
Color	White	White	Black
Processor	1.83GHz Intel Core Duo	2GHz Intel Core Duo	2GHz Intel Core Duo
L2 Cache	2MB		
System bus	667MHz		
Memory	512MB of 667MHz DDR2 SDRAM (PC2-5300) on two SO-DIMMs, supports up to 2GB		
Hard drive	60GB 5400-rpm Serial ATA <sup>2</sup>	60GB 5400-rpm Serial ATA <sup>2</sup>	80GB 5400-rpm Serial ATA
Optical drive	Slot-loading Combo drive (DVD-ROM/CD-RW)	Slot-loading SuperDrive (DVD±RW/CD-RW)	
Graphics	Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory <sup>1</sup>		
Video camera	Built-in iSight		
Display	13.3-inch (diagonal) glossy TFT widescreen display, 1280 x 800 resolution		
Ports	One FireWire 400 port (8 watts); Two USB 2.0 ports (up to 480 Mbps); Mini-DVI port with support for DVI, VGA, S-video and composite video output (requires adapters, sold separately) <sup>4</sup>		
Audio	Built-in stereo speakers, built-in omnidirectional microphone, combined optical digital audio input/audio line in, combined optical digital audio output/headphone out		
Networking	Built-in 10/100/1000BASE-T (Gigabit)		
Wireless <sup>3</sup>	Built-in 54-Mbps AirPort Extreme wireless networking (802.11g standard)		
Limited warranty and service	Your MacBook comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.		

## Configure to Order

- 80GB hard drive
- 100GB hard drive
- 120GB hard drive
- Up to 2GB of 667MHz DDR2 SDRAM
- Apple Wireless Keyboard
- Apple Wireless Mouse
- Apple USB Modem

## Accessories

- AirPort Express Base Station
- AirPort Extreme Base Station
- Apple 8x DVD-R Media Kit
- Apple mini-DVI to DVI Adapter
- Apple mini-DVI to VGA Adapter
- Apple mini-DVI to Video Adapter
- Apple FireWire Cable
- AppleCare Protection Plan
- iWork

## In the Box

- MacBook
- Apple Remote
- 60W MagSafe Power Adapter, AC wall plug and power cord
- Lithium-polymer battery
- Install/restore DVDs
- Printed and electronic documentation

## Processor and memory

- 1.83GHz or 2.0GHz Intel Core Duo processor
- 2MB on-chip shared L2 cache



# 31\_MacBook - Technical Specifications.pdf

- 667MHz frontside bus
- 512MB of 667MHz DDR2 SDRAM (PC2-5300) on two SO-DIMMs; supports up to 2GB

## Storage

- 60GB or 80GB 5400-rpm Serial ATA hard disk drive; optional 80GB, 100GB or 120GB drive<sup>2</sup>
- One of the following optical drives:
  - Slot-loading Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed
  - Slot-loading SuperDrive with double-layer read support (DVD+R DL/DVD±RW/CD-RW): writes DVD-R and DVD+R discs at up to 4x speed, writes DVD-RW and DVD+RW discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 24x speed

## Battery and power

- 55-watt-hour lithium-polymer battery with integrated charge indicator LEDs
- 60W MagSafe Power Adapter with cable management system
- MagSafe power adapter port

## Graphics and Video Support

- Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory<sup>1</sup>
- Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 1920 x 1200 pixels on an external display, both at millions of colors
- Built-in iSight camera with 640-by-480-pixel resolution
- Mini-DVI port
- DVI output using mini-DVI to DVI adapter (sold separately)
- VGA output using mini-DVI to VGA adapter (sold separately)
- Composite and S-video output using mini-DVI to video adapter (sold separately)

## Communications

- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard)
- Built-in Bluetooth 2.0 + Enhanced Data Rate (EDR) up to 3 Mbps
- Optional external Apple USB Modem

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)

## Peripheral connections

- One FireWire 400 port (up to 400 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)

## Display

- 13.3-inch (diagonal) glossy widescreen. TFT display with support for millions of colors
- Supported resolutions: 1280 by 800 (native), 1152 by 720, 1024 by 768, 1024 by 640, 800 by 600, 800 by 500, 720 by 480, and 640 by 480 at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 at 3:2 aspect ratio

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

# 31\_MacBook - Technical Specifications.pdf

## Size and weight

- Height: 1.08 inches (2.75 cm)
- Width: 12.78 inches (32.5 cm)
- Depth: 8.92 inches (22.7 cm)
- Weight: 5.2 pounds (2.36 kg)

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork (30-day trial), Big Bang Board Games, Comic Life, Omni Outliner, and Apple Hardware Test
- Front Row

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded numeric keypad
- Solid-state scrolling trackpad for precise cursor control; supports two-finger scrolling, tap, double-tap, and drag capabilities
- Apple Remote

## Security

- Kensington cable lock slot

- 
1. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 80MB, resulting in 432MB of system memory available.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Wireless Internet access requires AirPort Express or AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.

Intel and Intel Core are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Internet access requires a compatible Internet service provider; fees may apply.

Product contains electronic documentation.

Backup copy of software is included.

Published Date: Apr 6, 2016

# Power Macintosh 6100/66 DOS Compatible: Technical Specifications

## Power Macintosh 6100/66 DOS Compatible

Logic Board	Ports	Power
Processor: 601, 66	USB:	Max Watts: 210
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: HDI-45	BTU per Hr: 718.2
Data Path: 64, 33	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: Intel 486DX2-66	Ethernet: AAUI-15	Pass Through: yes
Slots: PDS filled	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
	Port Notes: PC game port also available	
	Sound Notes: SoundBlaster 16 16-bit stereo sound out for PC multimedia compatibility>	
Memory	Video Memory	
Logic Board: 8 MB	Resolution Video Memory DRAM (HDI-45) (built in)	
RAM Slots: 2, 72-pin SIMM	512 x 384 16-bit	
Min - Max RAM: 8 MB - 72 MB	640 x 400 n/a-bit	
Min RAM Speed: 80	640 x 480 16-bit	
RAM Sizes: 4, 8, 16, 32 MB	800 x 600 n/a-bit	
Install in Groups of: 2	832 x 624 8-bit	
Notes: DOS card can accept one 72-pin SIMM (◆ 80 ns), up to 32MB in size	1024 x 768 n/a-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
	Notes: 512K RAM for DOS video	
Physical	Software	Storage

# 320\_Power Macintosh 6100-66 DOS Compatible- Technical Specifications.pdf

Introduced:	1/3/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	5/18/1996	Orig SSW:	7.5	Floppy Inject:	manual
Form Factor:	Centris 610	Orig Enabler:	PowerPC Enabler v1.1.1	Min. Int HD Size:	350-500MB
Gestalt ID:	100	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	14	ROM Ver:	\$20	Orig CD Speed	2x
Dimensions (in):	3.4 H x 16.3 W x 15.6 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	n/a		
		Mac OS Supported:	7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		
		Notes:	Includes Microsoft MS-DOS 6.22 and Windows 3.1		

Published Date: Jul 26, 2017

# Power Macintosh 6200/75: Technical Specifications

## Power Macintosh 6200/75

Logic Board	Ports	Power
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: 10/100 Base T FireWire: 2 Mic Type: PlainTalk AirPort Ready: Yes Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound Notes: INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	Max Watts: 150 Amps: 1.25 BTU per Hr: 513 Voltage: 115 V AC (90 V to 132 V AC) or 230 V AC (180 V to 264 V AC) Freq Range: 47-63 Hz Battery Type: 4.5V alkaline Soft Power: yes Pass Through: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	ResolutionVideo Memory1MB DRAM (built in) 512 x 384n/a-bit 640 x 400n/a-bit 640 x 48016-bit 800 x 6008-bit 832 x 6248-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 5/1/1995 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D Notes: This system is not sold in the U.S.	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 500MB Int HD Interface: IDE Orig CD Speed 4x Int CD Support: yes



# Macintosh Performa 5400/160: Technical Specifications

Macintosh Performa 5400/160

Logic Board		Ports		Power	
Processor:	603e, 160	USB:		Max Watts:	220
PMMU:	integrated	ADB:		Amps:	4
FPU:	integrated	Video:		BTU per Hr:	752.4
Data Path:	64, 40	Floppy:		Voltage:	110-240
L1 Cache:	32K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	opt'l.	Geoports:		Battery Type:	4.5V alkaline
2nd Processor:	opt. PC Compatibility Card	Ethernet:		Soft Power:	yes
Slots:	PCI, comm, TV, video in/out	FireWire:			
		Mic Type:		PlainTalk	
		AirPort Ready:			
		Other Ports:		Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory		Video Memory			
Logic Board:	8 MB	ResolutionVideo Memory 1MB DRAM (built in)			
RAM Slots:	2, 168-pin DIMM	512 x 384n/a-bit			
Min - Max RAM:	16 MB - 136 MB	640 x 400n/a-bit			
Min RAM Speed:	70	640 x 48016-bit			
RAM Sizes:	8, 16, 32, 64 MB	800 x 60016-bit			
Install in Groups of:	1	832 x 6248-bit			
		1024 x 7688-bit			
		1152 x 870n/a-bit			
		1280 x 1024n/a-bit			
		Notes: Video in not supported above 800x600.			
Physical		Software		Storage	
Introduced:	8/5/1996	Addressing Modes:		Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:		Floppy Inject:	manual
Form Factor:	PM 5200	Orig Enabler:		Min. Int HD Size:	1.6GB
Gestalt ID:	74	ROM ID:		Int HD Interface:	IDE
Weight (lbs):	47	ROM Ver:		Orig CD Speed	8x
Dimensions (in):	17.5 H x 15.1 W x 16 D	ROM Size:		Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:			
		Mac OS Supported:			

Published Date: Jul 25, 2017

# Power Macintosh 6300/120: Technical Specifications

## Power Macintosh 6300/120

Logic Board	Ports	Power
Processor: 603e, 120	USB:	Max Watts: 55
PMMU: integrated	ADB: 1	Amps: 1.25
FPU: integrated	Video: DB-15	BTU per Hr: 188.1
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: none	Soft Power: yes
Slots: LC, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
	Sound Notes: INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	
Memory	Video Memory	
Logic Board: none	Resolution Video Memory 1MB DRAM (built in)	
RAM Slots: 2, 72-pin SIMM	512 x 384 n/a-bit	
Min - Max RAM: 16 MB - 64 MB	640 x 400 n/a-bit	
Min RAM Speed: 80	640 x 480 16-bit	
RAM Sizes: 4, 8, 16, 32 MB	800 x 600 8-bit	
Install in Groups of: 1	832 x 624 8-bit	
	1024 x 768 n/a-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
	Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 6/27/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.1	Floppy Inject: manual
Form Factor: Quadra 630	Orig Enabler: System Enabler 406	Min. Int HD Size: 1.2GB
Gestalt ID: 42	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 19	ROM Ver: n/a	Orig CD Speed: 4x
Dimensions (in): 4.3 H x 12.6 W x 16.5 D	ROM Size: 4MB	Int CD Support: yes
Notes: This system is not sold in the U.S.	AppleTalk Ver: 58.1.3	
	Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	



Published Date: Jul 26, 2017

# Macintosh Performa 5400/180: Technical Specifications

Macintosh Performa 5400/180

Logic Board		Ports		Power																			
Processor:	603e, 180	USB:		Max Watts:	220																		
PMMU:	integrated	ADB:		Amps:	4																		
FPU:	integrated	Video:		BTU per Hr:	752.4																		
Data Path:	64, 40	Floppy:		Voltage:	110-240																		
L1 Cache:	32K	SCSI:		Freq Range:	50-60 Hz																		
L2 Cache:	opt'l.	Geoports:		Battery Type:	4.5V alkaline																		
2nd Processor:	opt. PC Compatibility Card	Ethernet:		Soft Power:	yes																		
Slots:	PCI, comm, TV, video in/out	FireWire:																					
		Mic Type:		PlainTalk																			
		AirPort Ready:																					
		Other Ports:		Printer Modem Speaker ,Headphone ,Remote Control ,																			
Memory		Video Memory																					
Logic Board:	8 MB	<table><tr><td>Resolution</td><td>Video Memory 1MB DRAM (built in)</td></tr><tr><td>512 x 384</td><td>n/a-bit</td></tr><tr><td>640 x 400</td><td>n/a-bit</td></tr><tr><td>640 x 480</td><td>16-bit</td></tr><tr><td>800 x 600</td><td>16-bit</td></tr><tr><td>832 x 624</td><td>8-bit</td></tr><tr><td>1024 x 768</td><td>8-bit</td></tr><tr><td>1152 x 870</td><td>n/a-bit</td></tr><tr><td>1280 x 1024</td><td>n/a-bit</td></tr></table>				Resolution	Video Memory 1MB DRAM (built in)	512 x 384	n/a-bit	640 x 400	n/a-bit	640 x 480	16-bit	800 x 600	16-bit	832 x 624	8-bit	1024 x 768	8-bit	1152 x 870	n/a-bit	1280 x 1024	n/a-bit
Resolution	Video Memory 1MB DRAM (built in)																						
512 x 384	n/a-bit																						
640 x 400	n/a-bit																						
640 x 480	16-bit																						
800 x 600	16-bit																						
832 x 624	8-bit																						
1024 x 768	8-bit																						
1152 x 870	n/a-bit																						
1280 x 1024	n/a-bit																						
RAM Slots:	2, 168-pin DIMM																						
Min - Max RAM:	16 MB - 136 MB																						
Min RAM Speed:	70																						
RAM Sizes:	8, 16, 32, 64 MB																						
Install in Groups of:	1																						

Published Date: Jul 25, 2017

# Macintosh Performa 5410CD:Technical Specifications

Macintosh Performa 5410CD

Logic Board	Ports	Power
Processor: 603e, 120	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatibility Card	Ethernet: none	Soft Power: yes
Slots: PCI, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	ResolutionVideo Memory1MB DRAM (built in)	
RAM Slots: 2, 168-pin DIMM	512 x 384 n/a-bit	
Min - Max RAM: 16 MB - 136 MB	640 x 400 n/a-bit	
Min RAM Speed: 70	640 x 480 16-bit	
RAM Sizes: 8, 16, 32, 64 MB	800 x 600 8-bit	
Install in Groups of: 1	832 x 624 8-bit	
	1024 x 768 n/a-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
	Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 4/22/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: System Enabler 410	Min. Int HD Size: 1.6GB
Gestalt ID: 74	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 47	ROM Ver: \$29	Orig CD Speed 4x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
Notes: This system is not sold in the U.S.	AppleTalk Ver: 58.1.5	
	Mac OS 7.5.3	
	Supported: 7.5.5	
	7.6	
	7.6.1	
	8.0	

# Power Macintosh 6300/160: Technical Specifications

## Power Macintosh 6300/160

Logic Board	Ports	Power
Processor: 603e, 160	USB:	Max Watts: 150
PMMU: integrated	ADB: 1	Amps: 5
FPU: integrated	Video: DB-15	BTU per Hr: 513
Data Path: 64, 40	Floppy: none	Voltage: 90-270
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatbility Card	Ethernet: none	Soft Power: yes
Slots: PCI, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 136 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	16-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	8-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 10/1/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: Quadra 630	Orig Enabler: System Enabler 410	Min. Int HD Size: 1.2GB
Gestalt ID: 58	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 17	ROM Ver: n/a	Orig CD Speed: 8x
Dimensions (in): 4.3 H x 12.6 W x 16.5 D	ROM Size: 4MB	Int CD Support: yes
Notes: This system is not sold in the U.S.	AppleTalk Ver: n/a	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0 8.1 8.5 8.6 9	

# Power Macintosh 6400/200: Technical Specifications

## Power Macintosh 6400/200

Logic Board	Ports	Power
Processor: 603e, 200	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatbility Card	Ethernet: none	Soft Power: yes
Slots: 2 PCI, Comm II, TV, video in	FireWire:	Pass Through: yes
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 136 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	16-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	8-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 10/1/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: Performa 6400	Orig Enabler: System Enabler 410 v1.1	Min. Int HD Size: 2.4GB
Gestalt ID: 58	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 44.5	ROM Ver: \$29	Orig CD Speed 8x
Dimensions (in): 16 H x 7.8 W x 16.9 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.1.5	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	

# Macintosh Performa 5420CD

## Macintosh Performa 5420CD

Logic Board	Ports	Power
Processor: 603e, 120	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 4
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 110-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatibility Card	Ethernet: none	Soft Power: yes
Slots: PCI, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 136 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	16-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	8-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
	Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 4/22/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 5200	Orig Enabler: System Enabler 410	Min. Int HD Size: 1.6GB
Gestalt ID: 74	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 47	ROM Ver: \$29	Orig CD Speed 4x
Dimensions (in): 17.5 H x 15.1 W x 16 D	ROM Size: 4MB	Int CD Support: yes
Notes: This system is not sold in the U.S.	AppleTalk Ver: 58.1.5	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0	

# Power Macintosh 6500/225: Technical Specifications

## Power Macintosh 6500/225

Logic Board	Ports	Power
Processor: 603e, 225	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 50	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: 10baseT	Soft Power: yes
Slots: 2 PCI, Comm II, TV, video in	FireWire:	Pass Through: yes
Notes: Some models ship with a modem in the comm slot II.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer, Modem, Speaker, Headphone, Remote Control, ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB SGRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 32 MB - 128 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	24-bit
RAM Sizes: 4, 8, 16, 32, 64 MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
	1024 x 768	16-bit
	1152 x 870	16-bit
	1280 x 1024	8-bit
Physical	Software	Storage
Introduced: 2/17/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.5	Floppy Inject: manual
Form Factor: Performa 6400	Orig Enabler: System Enabler 411	Min. Int HD Size: 2, 3GB
Gestalt ID: 513	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 44.5	ROM Ver: \$35	Orig CD Speed 12x
Dimensions (in): 16 H x 7.8 W x 16.9 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.5.5, 7.6.1, 8.0, 8.1, 8.5, 8.6, 9	

# MacBook Pro (15-inch Glossy) - Technical Specifications

This article has been archived and is no longer updated by Apple.

	15.4-inch: 2.0GHz (MA600LL)	15.4-inch: 2.16GHz (MA601LL)
<b>Processor</b>	2.0GHz Intel Core Duo	2.16GHz Intel Core Duo
<b>Memory</b>	512MB (single SODIMM) 667MHz DDR2 SDRAM (PC2-5300)	1GB (single SODIMM) 667MHz DDR2 SDRAM (PC2-5300)
<b>Display</b>	15.4-inch (diagonal), 1440 x 900 resolution, TFT widescreen	
<b>PCI Express Graphics</b>	ATI Mobility Radeon X1600 with 128MB of GDDR3 SDRAM and dual-link DVI	ATI Mobility Radeon X1600 with 256MB of GDDR3 SDRAM and dual-link DVI
<b>Video</b>	Built-in iSight Camera, DVI, VGA (DVI to VGA adapter included)	
<b>Audio</b>	Combined optical digital input/audio line in, combined optical digital output/headphone out, stereo speakers, microphone	
<b>Hard disk drive</b> <sup>(3)</sup>	80GB Serial ATA/100; 5400 rpm	100GB Serial ATA/100; 5400 rpm
<b>Slot-loading optical drive</b>	4x SuperDrive (DVD±RW/CD-RW)	
<b>Ethernet</b>	Built-in 10/100/1000BASE-T (Gigabit)	
<b>Wireless</b> <sup>(2)</sup>	Built-in 54-Mbps AirPort Extreme (802.11g); built-in Bluetooth 2.0+EDR	
<b>Modem</b>	Apple USB Modem (sold separately)	
<b>Input</b>	Apple Remote; full-size, illuminated keyboard with ambient light sensor; Scrolling Trackpad	
<b>Expansion</b>	One FireWire 400, two USB 2.0 ports, and ExpressCard/34 slot	
<b>Weight</b>	5.6 pounds	
<b>Footprint</b>	14.1 x 9.6 inches	
<b>Thickness</b>	1.0 inch (2.59 cm)	
<b>Video accessories</b>	DVI to VGA adapter included (other adapters sold separately)	
<b>Hardware accessories</b>	85W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery	
<b>Limited warranty and service</b>	Your MacBook Pro comes with 90 days of telephone support and a one-year limited warranty. For more information, visit Apple support or call 800-823-2775.	

## Online store options

- Up to 2GB main memory
- 100GB 5400-rpm, 100GB 7200-rpm, 120GB 5400-rpm hard drive <sup>(3)</sup>
- Apple Wireless Keyboard
- Apple USB Modem
- Apple Wireless Mouse
- Apple Keyboard
- Apple Mighty Mouse
- AirPort Extreme
- AirPort Express
- Apple DVI to Video Adapter
- Apple 85W MagSafe Power Adapter
- Rechargeable Battery, 15-inch MacBook Pro
- iWork
- AppleCare Protection Plan

## In the box

- MacBook Pro
- 85W MagSafe Power Adapter, AC wall plug and power cord
- Lithium-polymer battery
- Apple Remote
- DVI to VGA adapter
- Install/restore DVDs
- Printed and electronic documentation

## Processor and Memory



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- 2.0 or 2.16GHz Intel Core Duo processor, 2MB on chip shared L2 cache running 1:1 with processor speed
- 512MB (single SODIMM) of PC2-5300 (667MHz) DDR2 memory on 2.0GHz configuration; and 1GB (single SODIMM) on 2.16GHz configuration; two SODIMM slots support up to 2GB
- 667MHz frontside bus

## Expansion

- One FireWire 400 port at up to 400 Mbps
- Two 480-Mbps USB 2.0 ports
- ExpressCard/34 slot

## Security

- Kensington cable lock slot

## Battery and power

- 60-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life<sup>(1)</sup>
- 85W MagSafe Power Adapter with cable management system
- MagSafe Power Adapter port

## Communications

- Built-in 54-Mbps AirPort Extreme wireless networking (802.11g standard)<sup>(2)</sup>.
- Built-in Bluetooth 2.0+EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Combined optical digital input/audio line in (minijack)
- Combined optical digital output/headphone out (minijack)
- Built-in stereo speakers
- Internal omnidirectional microphone (located under left speaker grille)

## Video and graphics support

- ATI Mobility Radeon X1600 graphics processor, dual link DVI support, 128MB of GDDR3 on 2.0GHz configuration. 256MB GDDR3 on 2.16GHz configuration
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- DVI output port
- VGA output using included DVI to VGA adapter
- Built-in iSight camera

## Storage

- 80GB 5400-rpm Serial ATA hard drive on 2.0GHz configuration. Optional 100GB 5400-rpm, 100GB 7200-rpm, 120GB 5400-rpm drives<sup>(3)</sup>.
- 100GB 5400-rpm Serial ATA hard drive on 2.16GHz configuration. Optional 100GB 7200-rpm or 120GB 5400-rpm hard drives.
- 4x Slot-loading SuperDrive (DVD±RW/CD-RW)
  - Maximum Write: 4x DVD-R, DVD+R, DVD+RW, and DVD-RW; 24x CD-R; 10x CD-RW
  - Maximum Read: 8x DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R, DVD+R, DVD+RW, DVD-RW; 4x DVD+R (double layered) and DVD-R (double layered); 24x CD

## Display

- 15.4-inch (diagonal) TFT display, support for millions of colors; Optional glossy widescreen display
- Supported resolutions: 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio, 720 by 480 at 3:2 aspect ratio stretched

## Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and

# 32\_MacBook Pro (15-inch Glossy) - Technical Specifications.pdf

embedded numeric keypad

- Backlit keyboard with ambient light sensors for automatic adjustment of keyboard illumination and screen brightness
- Solid-state scrolling Trackpad for precise cursor control; supports two finger scrolling, tap, double-tap, and drag capabilities
- Apple Remote included

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- DC input: 18.5 Vdc, 4.6 A max.
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and weight

- Height: 1.0 inch (2.59 cm)
- Width: 14.1 inches (35.7 cm)
- Depth: 9.6 inches (24.3 cm)
- Weight: 5.6 pounds (2.54 kg) with battery and optical drive installed <sup>(4)</sup>

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork '06 (30-day trial), Comic Life, FileMaker Pro trial, Omni Outliner
- Photo Booth
- Front Row

- 
1. Battery life depends on configuration and use.
  2. Wireless Internet access requires base station or other wireless access point and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.
  3. 1GB = 1 billion bytes; actual formatted capacity less.
  4. Actual weight varies by configuration and manufacturing process

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Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

# Macintosh Performa 5430: Technical Specifications

Macintosh Performa 5430

Logic Board		Ports		Power	
Processor:	603e, 160	USB:		Max Watts:	220
PMMU:	integrated	ADB:		Amps:	4
FPU:	integrated	Video:		BTU per Hr:	752.4
Data Path:	64, 40	Floppy:		Voltage:	110-240
L1 Cache:	32K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	opt'l.	Geoports:		Battery Type:	4.5V alkaline
2nd Processor:	opt. PC Compatibility Card	Ethernet:		Soft Power:	yes
Slots:	PCI, comm, TV, video in/out	FireWire:			
		Mic Type:		PlainTalk	
		AirPort Ready:			
		Other Ports:		Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory		Video Memory			
Logic Board:	8 MB	Resolution		Video Memory 1MB DRAM (built in)	
RAM Slots:	2, 168-pin DIMM	512 x 384		n/a-bit	
Min - Max RAM:	16 MB - 136 MB	640 x 400		n/a-bit	
Min RAM Speed:	70	640 x 480		16-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600		16-bit	
Install in Groups of:	1	832 x 624		8-bit	
		1024 x 768		8-bit	
		1152 x 870		n/a-bit	
		1280 x 1024		n/a-bit	
		Notes: Video in not supported at 832x624.			
Physical		Software		Storage	
Introduced:	11/12/1996	Addressing Modes:		Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:		Floppy Inject:	manual
Form Factor:	PM 5200	Orig Enabler:		Min. Int HD Size:	1.6GB
Gestalt ID:	74	ROM ID:		Int HD Interface:	IDE
Weight (lbs):	47	ROM Ver:		Orig CD Speed	8x
Dimensions (in):	17.5 H x 15.1 W x 16 D	ROM Size:		Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:			
		Mac OS Supported:			
		7.5.3			
		7.5.5			
		7.6			
		7.6.1			
		8.0			

Published Date: Jul 25, 2017

# Power Macintosh 6500/250: Technical Specifications

## Power Macintosh 6500/250

Logic Board	Ports	Power
Processor: 603e, 250	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 50	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: 10baseT	Soft Power: yes
Slots: 2 PCI, Comm II, TV, video in	FireWire:	Pass Through: yes
Notes: Some models ship with a modem in the comm slot II.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB SGRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 32 MB - 128 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	24-bit
RAM Sizes: 4, 8, 16, 32, 64 MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
	1024 x 768	16-bit
	1152 x 870	16-bit
	1280 x 1024	8-bit
Physical	Software	Storage
Introduced: 2/17/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.5	Floppy Inject: manual
Form Factor: Performa 6400	Orig Enabler: System Enabler 411	Min. Int HD Size: 3, 4GB
Gestalt ID: 513	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 44.5	ROM Ver: \$35	Orig CD Speed: 12x, 24x
Dimensions (in): 16 H x 7.8 W x 16.9 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	Notes: Some systems ship with an Iomega Zip drive.
	Mac OS Supported: 7.5.5 7.6.1 8.0 8.1 8.5 8.6 9	

# Power Macintosh 6500/275: Technical Specifications

## Power Macintosh 6500/275

Logic Board	Ports	Power
Processor: 603e, 275	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 50	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 512K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: 10baseT	Soft Power: yes
Slots: 2 PCI, Comm II, TV, video in	FireWire:	Pass Through: yes
Notes: Some systems come with the Avid Cinema card, which occupies one PCI slot. Some models ship with a 33.6 kps modem in the comm slot II.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB SGRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 32 MB - 128 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	24-bit
RAM Sizes: 4, 8, 16, 32, 64 MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
	1024 x 768	16-bit
	1152 x 870	16-bit
	1280 x 1024	8-bit
Physical	Software	Storage
Introduced: 4/4/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.6.1	Floppy Inject: manual
Form Factor: Performa 6400	Orig Enabler: n/a	Min. Int HD Size: 4, 6GB
Gestalt ID: 513	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 44.5	ROM Ver: \$35	Orig CD Speed: 12x, 24x
Dimensions (in): 16 H x 7.8 W x 16.9 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	Notes: Some systems ship with an Iomega Zip drive.
	Mac OS Supported: 7.6.1 8.0 8.1 8.5 8.6 9	

# Macintosh Performa 5440: Technical Specifications

Macintosh Performa 5440

Logic Board		Ports		Power	
Processor:	603e, 180	USB:		Max Watts:	220
PMMU:	integrated	ADB:		Amps:	4
FPU:	integrated	Video:		BTU per Hr:	752.4
Data Path:	64, 40	Floppy:		Voltage:	110-240
L1 Cache:	32K	SCSI:		Freq Range:	50-60 Hz
L2 Cache:	opt'l.	Geoports:		Battery Type:	4.5V alkaline
2nd Processor:	opt. PC Compatibility Card	Ethernet:		Soft Power:	yes
Slots:	PCI, comm, TV, video in/out	FireWire:			
		Mic Type:		PlainTalk	
		AirPort Ready:			
		Other Ports:		Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory		Video Memory			
Logic Board:	8 MB	Resolution		Video Memory 1MB DRAM (built in)	
RAM Slots:	2, 168-pin DIMM	512 x 384		n/a-bit	
Min - Max RAM:	16 MB - 136 MB	640 x 400		n/a-bit	
Min RAM Speed:	70	640 x 480		16-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600		16-bit	
Install in Groups of:	1	832 x 624		8-bit	
		1024 x 768		8-bit	
		1152 x 870		n/a-bit	
		1280 x 1024		n/a-bit	
		Notes: Video in not supported at 832x624.			
Physical		Software		Storage	
Introduced:	11/12/1996	Addressing Modes:		Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:		Floppy Inject:	manual
Form Factor:	PM 5200	Orig Enabler:		Min. Int HD Size:	1.6GB
Gestalt ID:	74	ROM ID:		Int HD Interface:	IDE
Weight (lbs):	47	ROM Ver:		Orig CD Speed	8x
Dimensions (in):	17.5 H x 15.1 W x 16 D	ROM Size:		Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:			
		Mac OS Supported:			
		7.5.3			
		7.5.5			
		7.6			
		7.6.1			
		8.0			

Published Date: Jul 25, 2017

# Power Macintosh 6500/300: Technical Specifications

## Power Macintosh 6500/300

Logic Board	Ports	Power
Processor: 603e, 300	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 50	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 512K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: none	Ethernet: 10baseT	Soft Power: yes
Slots: 2 PCI, Comm II, TV, video in	FireWire:	Pass Through: yes
Notes: Some models ship with a 33.6 kps modem in the comm slot II.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB SGRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 64 MB - 128 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	24-bit
RAM Sizes: 4, 8, 16, 32, 64 MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
	1024 x 768	16-bit
	1152 x 870	16-bit
	1280 x 1024	8-bit
Physical	Software	Storage
Introduced: 4/4/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.6.1	Floppy Inject: manual
Form Factor: Performa 6400	Orig Enabler: n/a	Min. Int HD Size: 4, 6GB
Gestalt ID: 513	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 44.5	ROM Ver: \$35	Orig CD Speed: 12x, 24x
Dimensions (in): 16 H x 7.8 W x 16.9 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	Notes: Some systems ship with an Iomega Zip drive.
	Mac OS Supported: 7.6.1 8.0 8.1 8.5 8.6 9	

# Macintosh Performa 6110CD:Technical Specifications

Macintosh Performa 6110CD

Logic Board		Ports	Power
Processor:	601, 60	USB:	Max Watts: 210
PMMU:	integrated	ADB:	1
FPU:	integrated	Video:	HDI-45
Data Path:	64, 30	Floppy:	none
L1 Cache:	32K	SCSI:	DB-25
L2 Cache:	opt'l.	Geoports:	2
2nd Processor:	opt. Intel 486DX2-66	Ethernet:	AAUI-15
Slots:	one 7♦ NuBus or PDS	FireWire:	
		Mic Type:	PlainTalk
		AirPort Ready:	
		Other Ports:	Printer Modem Speaker ,
Memory		Video Memory	
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots:	2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM:	8 MB - 72 MB	640 x 400	n/a-bit
Min RAM Speed:	80	640 x 480	16-bit
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of:	2	832 x 624	8-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
Physical		Software	Storage
Introduced:	11/1/1994	Addressing Modes:	32-bit
Discontinued:	n/a	Orig SSW:	7.5
Form Factor:	Centris 610	Orig Enabler:	none
Gestalt ID:	75	ROM ID:	\$077D
Weight (lbs):	14	ROM Ver:	\$A4
Dimensions (in):	3.4 H x 16.3 W x 15.6 D	ROM Size:	4MB
		AppleTalk Ver:	58.0.2
		Mac OS	7.5
		Supported:	7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0
			Floppy Size: 1.44MB
			Floppy Inject: manual
			Min. Int HD Size: 250MB
			Int HD Interface: SCSI
			Orig CD Speed 2x
			Int CD Support: yes

Published Date: Jul 25, 2017



# Power Macintosh 7100/66: Technical Specifications

## Power Macintosh 7100/66

Logic Board		Ports		Power	
Processor:	601, 66	USB:		Max Watts:	230
PMMU:	integrated	ADB: 1		Amps:	1.9
FPU:	integrated	Video: DB-15, HDI-45		BTU per Hr:	786.6
Data Path:	64, 33	Floppy: none		Voltage:	100-240
L1 Cache:	32K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	opt'l.	Geoports: 2		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet: AAUI-15		Soft Power:	yes
Slots:	3 NuBus, PDS filled	FireWire:		Pass Through:	yes
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
Memory		Video Memory			
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (4x256K)
RAM Slots:	4, 72-pin SIMM	512 x 384	16 -bit	16-bit	24-bit
Min - Max RAM:	8 MB - 136 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	80	640 x 480	16-bit	16-bit	24-bit
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	n/a-bit	n/a-bit	n/a-bit
Install in Groups of:	2	832 x 624	8-bit	16-bit	24-bit
		1024 x 768	n/a -bit	8-bit	16-bit
		1152 x 870	n/a-bit	8-bit	16-bit
		1280 x 1024	n/a-bit	n/a-bit	n/a-bit
Physical		Software		Storage	
Introduced:	3/14/1994	Addressing Modes: 32-bit		Floppy Size:	1.44MB
Discontinued:	1/3/1995	Orig SSW: 7.1.2		Floppy Inject:	manual
Form Factor:	IIVx	Orig Enabler: PowerPC Enabler v1.0		Min. Int HD Size:	250-500MB
Gestalt ID:	112	ROM ID: \$077D		Int HD Interface:	SCSI
Weight (lbs):	25	ROM Ver: \$A4		Orig CD Speed	2x
Dimensions (in):	6 H x 13 W x 16.5 D	ROM Size: 4MB		Int CD Support:	yes
		AppleTalk Ver: 58.0.2			
		Mac OS Supported:			
		7.1.2			
		7.5			
		7.5.1			
		7.5.3			
		7.5.5			
		7.6			
		7.6.1			
		8.0			
		8.5			
		8.1			
		8.6			
		9			

# Macintosh Performa 6112CD:Technical Specifications

Macintosh Performa 6112CD

Logic Board		Ports	Power
Processor:	601, 60	USB:	Max Watts: 210
PMMU:	integrated	ADB:	1
FPU:	integrated	Video:	HDI-45
Data Path:	64, 30	Floppy:	none
L1 Cache:	32K	SCSI:	DB-25
L2 Cache:	opt'l.	Geoports:	2
2nd Processor:	opt. Intel 486DX2-66	Ethernet:	AAUI-15
Slots:	one 7♦ NuBus or PDS	FireWire:	
		Mic Type:	PlainTalk
		AirPort Ready:	
		Other Ports:	Printer Modem Speaker ,
Memory		Video Memory	
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots:	2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM:	8 MB - 72 MB	640 x 400	n/a-bit
Min RAM Speed:	80	640 x 480	16-bit
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of:	2	832 x 624	8-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
Physical		Software	Storage
Introduced:	11/1/1994	Addressing Modes:	32-bit
Discontinued:	n/a	Orig SSW:	7.5
Form Factor:	Centris 610	Orig Enabler:	none
Gestalt ID:	75	ROM ID:	\$077D
Weight (lbs):	14	ROM Ver:	\$A4
Dimensions (in):	3.4 H x 16.3 W x 15.6 D	ROM Size:	4MB
		AppleTalk Ver:	58.0.2
		Mac OS	7.5
		Supported:	7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0
			Floppy Size: 1.44MB
			Floppy Inject: manual
			Min. Int HD Size: 250MB
			Int HD Interface: SCSI
			Orig CD Speed 2x
			Int CD Support: yes

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# Power Macintosh 7100/66AV: Technical Specifications

## Power Macintosh 7100/66AV

Logic Board	Ports	Power
Processor: 601, 66	USB:	Max Watts: 230
PMMU: integrated	ADB: 1	Amps: 1.9
FPU: integrated	Video: DB-15, HDI-45	BTU per Hr: 786.6
Data Path: 64, 33	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: 3 NuBus, PDS filled	FireWire:	Pass Through: yes
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
	Port Notes: Includes S-video ports for video in and out. RCA ports available via included adapter.	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 4, 72-pin SIMM		Video Memory 2MB VRAM (built in)
Min - Max RAM: 8 MB - 136 MB	512 x 384	16-bit
Min RAM Speed: 80	640 x 400	n/a-bit
RAM Sizes: 4, 8, 16, 32 MB	640 x 480	16-bit
Install in Groups of: 2	800 x 600	n/a-bit
	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 3/14/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 1/3/1995	Orig SSW: 7.1.2	Floppy Inject: manual
Form Factor: IIVx	Orig Enabler: PowerPC Enabler v1.0	Min. Int HD Size: 250-500MB
Gestalt ID: 112	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: \$A4	Orig CD Speed: 2x
Dimensions (in): 6 H x 13 W x 16.5 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.1.2 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	

# Macintosh Performa 6115CD:Technical Specifications

Macintosh Performa 6115CD

Logic Board	Ports	Power
Processor: 601, 60	USB:	Max Watts: 210
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: HDI-45	BTU per Hr: 718.2
Data Path: 64, 30	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. Intel 486DX2-66	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7♦ NuBus or PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 8 MB - 72 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 2	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 11/1/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5	Floppy Inject: manual
Form Factor: Centris 610	Orig Enabler: none	Min. Int HD Size: 350MB
Gestalt ID: 75	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$A4	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS 7.5	
	Supported: 7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	

# MacBook Pro (17-inch) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Configurations

	17-inch: 2.16GHz (MA092LL/A)
<b>Processor</b>	2.16GHz Intel Core Duo
<b>Memory</b>	1GB (single SODIMM) 667MHz DDR2 SDRAM (PC2-5300)
<b>Display</b>	17-inch (diagonal), 1680 x 1050 resolution, TFT widescreen
<b>PCI Express Graphics</b>	ATI Mobility Radeon X1600 with 256MB of GDDR3 SDRAM and dual-link DVI
<b>Video</b>	Built-in iSight Camera, DVI, VGA (DVI to VGA adapter included)
<b>Audio</b>	Combined optical digital input/audio line in, combined optical digital output/headphone out, stereo speakers, microphone
<b>Hard disk drive</b> <sup>(2)</sup>	120GB Serial ATA/100; 5400 rpm
<b>Slot-loading optical drive</b>	SuperDrive (DVD+R DL/DVD±RW/CD-RW)
<b>Ethernet</b>	Built-in 10/100/1000BASE-T (Gigabit)
<b>Wireless</b> <sup>(3)</sup>	Built-in 54-Mbps AirPort Extreme (802.11g standard); built-in Bluetooth 2.0+EDR
<b>Modem</b>	Apple USB Modem (sold separately)
<b>Input</b>	Apple Remote; full-size, illuminated keyboard with ambient light sensor; Scrolling Trackpad
<b>Expansion</b>	One FireWire 400, one FireWire 800, three USB 2.0 ports, and ExpressCard/34 slot
<b>Weight</b>	6.8 pounds
<b>Footprint</b>	15.4 x 10.4 inches
<b>Thickness</b>	1.0 inch (2.59 cm)
<b>Video accessories</b>	DVI to VGA adapter included (other adapters sold separately)
<b>Hardware accessories</b>	85W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery
<b>Limited warranty and service</b>	Your MacBook Pro comes with 90 days of telephone support and a one-year limited warranty. For more information, visit Apple support or call 800-823-2775.

## Options

- Up to 2GB main memory
- 100GB 7200-rpm, 120GB 5400-rpm hard drive (3)
- Apple Wireless Keyboard
- Apple USB Modem
- Apple Wireless Mouse
- Apple Keyboard
- Apple Mighty Mouse
- AirPort Extreme
- AirPort Express
- Apple DVI to Video Adapter
- Apple MagSafe Power Adapter
- Rechargeable Battery, 15-inch MacBook Pro
- Rechargeable Battery, 17-inch MacBook Pro
- iWork
- AppleCare Protection Plan

## In the box

- MacBook Pro
- MagSafe Power Adapter, AC wall plug and power cord
- Lithium-polymer battery
- Apple Remote
- DVI to VGA adapter
- Install/restore DVDs
- Printed and electronic documentation

# 33\_MacBook Pro (17-inch) - Technical Specifications.pdf

## Processor and Memory

- 2.16GHz Intel Core Duo processor, 2MB on chip shared L2 cache running 1:1 with processor speed
- 1GB (single SODIMM) of PC2-5300 (667MHz) DDR2 memory
- 667MHz frontside bus

## Expansion

- One FireWire 400 port at up to 400 Mbps
- One FireWire 800 port at up to 800 Mbps
- Three 480-Mbps USB 2.0 ports
- ExpressCard/34 slot

## Security

- Kensington cable lock slot

## Battery and power

- 68-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 5.5 hours of battery life<sup>(1)</sup>
- 85W MagSafe Power Adapter with cable management system
- MagSafe Power Adapter port

## Communications

- Built-in 54-Mbps AirPort Extreme (802.11g standard)<sup>(3)</sup>.
- Built-in Bluetooth 2.0+EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Combined optical digital input/audio line in (minijack)
- Combined optical digital output/headphone out (minijack)
- Built-in stereo speakers
- Internal omnidirectional microphone (located under left speaker grille)

## Video and graphics support

- ATI Mobility Radeon X1600 graphics processor, dual link DVI support, 256MB of GDDR3.
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- DVI output port
- VGA output using included DVI to VGA adapter
- Built-in iSight camera

## Storage

- 120GB 5400-rpm Serial ATA hard drive. Optional 100GB 7200-rpm drive<sup>(3)</sup>.
- 8x Slot-loading SuperDrive (DVD+R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R and DVD+R; 4x DVD-RW and DVD+RW; 2.4x DVD+R (double layer), 24x CD-R; 16x CD-RW
- Maximum read: 8x DVD-ROM (single layer); 6x DVD-ROM (double layer), DVD-R, DVD-RW, DVD+R and DVD+RW; 24x CD-R

## Display

- 17-inch (diagonal) TFT display, support for millions of colors
- Supported resolutions: 1680 by 1050 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1280 by 1024 at 5:4 aspect ratio; 1280 by 1024 at 5:4 aspect ratio stretched; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio; 720 by 480 at 3:2 aspect ratio stretched

## Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded numeric keypad
  - Backlit keyboard with ambient light sensors for automatic adjustment of keyboard illumination and screen brightness
- Solid-state scrolling Trackpad for precise cursor control; supports two finger scrolling, tap, double-tap, and drag capabilities

# 33\_MacBook Pro (17-inch) - Technical Specifications.pdf

- Apple Remote included

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- DC input: 18.5 Vdc, 4.6 A max.
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and weight

- Height: 1.0 inch (2.59 cm)
- Width: 15.4 inches (39.2 cm)
- Depth: 10.4 inches (26.5 cm)
- Weight: 6.8 pounds (3.1 kg) with battery and optical drive installed <sup>(4)</sup>

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork '06 (30-day trial), QuickBooks for Mac New User Edition, Comic Life, FileMaker Pro trial, Omni Outliner
- Photo Booth
- Front Row

- 
1. Battery life depends on configuration and use.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Wireless Internet access requires base station or other wireless access point and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.
  4. Actual weight varies by configuration and manufacturing process

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Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

# Power Macintosh 7100/80: Technical Specifications

## Power Macintosh 7100/80

Logic Board		Ports		Power	
Processor:	601, 80	USB:		Max Watts:	230
PMMU:	integrated	ADB: 1		Amps:	1.9
FPU:	integrated	Video: DB-15, HDI-45		BTU per Hr:	786.6
Data Path:	64, 40	Floppy:		Voltage:	100-240
L1 Cache:	32K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports: 2		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet: AAUI-15		Soft Power:	yes
Slots:	3 NuBus, PDS filled	FireWire:		Pass Through:	yes
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
Memory		Video Memory			
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (4x256K)
RAM Slots:	4, 72-pin SIMM	512 x 384	16 -bit	16-bit	24-bit
Min - Max RAM:	8 MB - 136 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	80	640 x 480	16-bit	16-bit	24-bit
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	n/a-bit	n/a-bit	n/a-bit
Install in Groups of:	2	832 x 624	8-bit	16-bit	24-bit
		1024 x 768	n/a -bit	8-bit	16-bit
		1152 x 870	n/a-bit	8-bit	16-bit
		1280 x 1024	n/a-bit	n/a-bit	n/a-bit
Physical		Software		Storage	
Introduced:	1/3/1995	Addressing Modes: 32-bit		Floppy Size:	1.44MB
Discontinued:	1/6/1996	Orig SSW: 7.5		Floppy Inject:	manual
Form Factor:	IIvx	Orig Enabler: PowerPC Enabler v1.1.1		Min. Int HD Size:	350-700MB
Gestalt ID:	47	ROM ID: \$077D		Int HD Interface:	SCSI
Weight (lbs):	25	ROM Ver: n/a		Orig CD Speed	2x
Dimensions (in):	6 H x 13 W x 16.5 D	ROM Size: 4MB		Int CD Support:	yes
		AppleTalk Ver: n/a			
		Mac OS 7.5			
		Supported: 7.5.1			
		7.5.3			
		7.5.5			
		7.6			
		7.6.1			
		8.0			
		8.5			
		8.1			
		8.6			
		9			



# Power Macintosh 7100/80AV: Technical Specifications

## Power Macintosh 7100/80AV

Logic Board	Ports	Power
Processor: 601, 80	USB:	Max Watts: 230
PMMU: integrated	ADB: 1	Amps: 1.9
FPU: integrated	Video: DB-15, HDI-45	BTU per Hr: 786.6
Data Path: 64, 40	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: 3 NuBus, PDS filled	FireWire:	Pass Through: yes
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
	Port Notes: Includes S-video ports for video in and out. RCA ports available via included adapter.	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 4, 72-pin SIMM		Video Memory 2MB VRAM (built in)
Min - Max RAM: 8 MB - 136 MB	512 x 384	16-bit
Min RAM Speed: 80	640 x 400	n/a-bit
RAM Sizes: 4, 8, 16, 32 MB	640 x 480	16-bit
Install in Groups of: 2	800 x 600	n/a-bit
	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 1/3/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 8/5/1995	Orig SSW: 7.5	Floppy Inject: manual
Form Factor: IIvx	Orig Enabler: PowerPC Enabler v1.1.1	Min. Int HD Size: 350-700MB
Gestalt ID: 47	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: n/a	Orig CD Speed: 2x
Dimensions (in): 6 H x 13 W x 16.5 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS Supported: 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	

# Macintosh Performa 6116CD:Technical Specifications

Macintosh Performa 6116CD

Logic Board	Ports	Power
Processor: 601, 60	USB:	Max Watts: 210
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: HDI-45	BTU per Hr: 718.2
Data Path: 64, 30	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. Intel 486DX2-66	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7♦ NuBus or PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 8 MB - 72 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 2	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 7/17/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.1	Floppy Inject: manual
Form Factor: Centris 610	Orig Enabler: none	Min. Int HD Size: 700MB
Gestalt ID: 75	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$A4	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS 7.5.1	
	Supported: 7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	

# Power Macintosh 7200/75: Technical Specifications

## Power Macintosh 7200/75

Logic Board		Ports		Power	
Processor:	601, 75	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 37.5	Floppy:	none	Voltage:	100-240
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	opt'l.	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatbility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (1x1MB)	Video Memory 4MB VRAM (3x1MB)
RAM Slots:	4, 168-pin DIMM	512 x 384	24-bit	24-bit	24-bit
Min - Max RAM:	8 MB - 256 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	70	640 x 480	16-bit	24-bit	24-bit
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	16-bit	24-bit	24-bit
Install in Groups of:	1	832 x 624	16-bit	24-bit	24-bit
Notes:	128MB DIMMs can be used, but have not been tested.	1024 x 768	8-bit	16-bit	24-bit
		1152 x 870	8-bit	16-bit	16-bit
		1280 x 1024	n/a-bit	8-bit	16-bit
Physical		Software		Storage	
Introduced:	8/8/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	3/16/1996	Orig SSW:	7.5.2	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	System Enabler 701 v1.1	Min. Int HD Size:	500MB
Gestalt ID:	108	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$28	Orig CD Speed	4x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.0.6		
		Mac OS Supported:	7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		

# Macintosh Performa 6117CD

## Macintosh Performa 6117CD

Logic Board	Ports	Power
Processor: 601, 60	USB:	Max Watts: 210
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: HDI-45	BTU per Hr: 718.2
Data Path: 64, 30	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. Intel 486DX2-66	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7 NuBus or PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 8 MB - 72 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 2	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 11/1/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5	Floppy Inject: manual
Form Factor: Centris 610	Orig Enabler: none	Min. Int HD Size: 350MB
Gestalt ID: 75	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$A4	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS 7.5	
	Supported: 7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	

# Power Macintosh 7200/90: Technical Specifications

## Power Macintosh 7200/90

Logic Board		Ports		Power	
Processor:	601, 90	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 45	Floppy:	none	Voltage:	100-240
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	opt'l.	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatibility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (1x1MB)	Video Memory 4MB VRAM (3x1MB)
RAM Slots:	4, 168-pin DIMM	512 x 384	24-bit	24-bit	24-bit
Min - Max RAM:	8 MB - 256 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	70	640 x 480	16-bit	24-bit	24-bit
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	16-bit	24-bit	24-bit
Install in Groups of:	1	832 x 624	16-bit	24-bit	24-bit
Notes:	128MB DIMMs can be used, but have not been tested.	1024 x 768	8-bit	16-bit	24-bit
		1152 x 870	8-bit	16-bit	16-bit
		1280 x 1024	n/a-bit	8-bit	16-bit
Physical		Software		Storage	
Introduced:	8/8/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	5/18/1996	Orig SSW:	7.5.2	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	System Enabler 701 v1.1	Min. Int HD Size:	500MB
Gestalt ID:	108	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$28	Orig CD Speed	4x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.0.6		
		Mac OS Supported:	7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		

# Macintosh Performa 6118CD:Technical Specifications

Macintosh Performa 6118CD

Logic Board	Ports	Power
Processor: 601, 60	USB:	Max Watts: 210
PMMU: integrated	ADB: 1	Amps: 1.7
FPU: integrated	Video: HDI-45	BTU per Hr: 718.2
Data Path: 64, 30	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. Intel 486DX2-66	Ethernet: AAUI-15	Pass Through: yes
Slots: one 7♦ NuBus or PDS	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 2, 72-pin SIMM	512 x 384	16-bit
Min - Max RAM: 8 MB - 72 MB	640 x 400	n/a-bit
Min RAM Speed: 80	640 x 480	16-bit
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	n/a-bit
Install in Groups of: 2	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 11/1/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5	Floppy Inject: manual
Form Factor: Centris 610	Orig Enabler: none	Min. Int HD Size: 500MB
Gestalt ID: 75	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 14	ROM Ver: \$A4	Orig CD Speed 2x
Dimensions (in): 3.4 H x 16.3 W x 15.6 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS 7.5	
	Supported: 7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	

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# Power Macintosh 7200/120: Technical Specifications

## Power Macintosh 7200/120

Logic Board		Ports		Power	
Processor:	601, 120	USB:		Max Watts:	150
PMMU:	integrated	ADB: 1		Amps:	3
FPU:	integrated	Video: DB-15		BTU per Hr:	513
Data Path:	64, 40	Floppy: none		Voltage:	100-240
L1 Cache:	32K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	opt'l.	Geoports: 2		Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatibility Card	Ethernet: AAUI, 10baseT		Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (1x1MB)	Video Memory 4MB VRAM (3x1MB)
RAM Slots:	4, 168-pin DIMM	512 x 384	24-bit	24-bit	24-bit
Min - Max RAM:	8 MB - 256 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	70	640 x 480	16-bit	24-bit	24-bit
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	16-bit	24-bit	24-bit
Install in Groups of:	1	832 x 624	16-bit	24-bit	24-bit
Notes:	128MB DIMMs can be used, but have not been tested.	1024 x 768	8-bit	16-bit	24-bit
		1152 x 870	8-bit	16-bit	16-bit
		1280 x 1024	n/a-bit	8-bit	16-bit
Physical		Software		Storage	
Introduced:	4/22/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	none	Min. Int HD Size:	1.2GB
Gestalt ID:	108	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$28	Orig CD Speed	4x, 8x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.0		
		Mac OS Supported:	7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		

# Macintosh Performa 6200CD:Technical Specifications

Macintosh Performa 6200CD

Logic Board	Ports		Power																			
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control Sound Notes: Some systems have 8-bit sound. INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>		Max Watts: 55 Amps: 1.25 BTU per Hr: 188.1 Voltage: 100-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes																			
Memory	Video Memory																					
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	<table><thead><tr><th>Resolution</th><th>Video Memory 1MB DRAM (built in)</th></tr></thead><tbody><tr><td>512 x 384</td><td>n/a-bit</td></tr><tr><td>640 x 400</td><td>n/a-bit</td></tr><tr><td>640 x 480</td><td>16-bit</td></tr><tr><td>800 x 600</td><td>8-bit</td></tr><tr><td>832 x 624</td><td>8-bit</td></tr><tr><td>1024 x 768</td><td>n/a-bit</td></tr><tr><td>1152 x 870</td><td>n/a-bit</td></tr><tr><td>1280 x 1024</td><td>n/a-bit</td></tr></tbody></table> Notes: Video in not supported at 832x624.				Resolution	Video Memory 1MB DRAM (built in)	512 x 384	n/a-bit	640 x 400	n/a-bit	640 x 480	16-bit	800 x 600	8-bit	832 x 624	8-bit	1024 x 768	n/a-bit	1152 x 870	n/a-bit	1280 x 1024	n/a-bit
Resolution	Video Memory 1MB DRAM (built in)																					
512 x 384	n/a-bit																					
640 x 400	n/a-bit																					
640 x 480	16-bit																					
800 x 600	8-bit																					
832 x 624	8-bit																					
1024 x 768	n/a-bit																					
1152 x 870	n/a-bit																					
1280 x 1024	n/a-bit																					
Physical	Software		Storage																			
Introduced: 5/1/1995 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0		Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes																			



# Power Macintosh 7200/120 PC Compatible: Technical Specifications

## Power Macintosh 7200/120 PC Compatible

Logic Board	Ports	Power		
Processor: 601, 120	USB:	Max Watts: 150		
PMMU: integrated	ADB: 1	Amps: 3		
FPU: integrated	Video: DB-15	BTU per Hr: 513		
Data Path: 64, 40	Floppy: none	Voltage: 100-240		
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz		
L2 Cache: opt'l.	Geoports: 2	Battery Type: 3.6V lithium		
2nd Processor: 100 MHz Pentium or 586	Ethernet: AAUI, 10baseT	Soft Power: yes		
Slots: 3 PCI	FireWire:	Pass Through: yes		
Notes: Systems ship with a PC Compatibility card installed, which occupies one PCI slot.	Mic Type: PlainTalk			
	AirPort Ready:			
	Other Ports: Printer Modem Speaker ,			
	Port Notes: Includes PC game port on PC Compatibility card.			
Memory	Video Memory			
Logic Board: none	Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (1x1MB)	Video Memory 4MB VRAM (3x1MB)
RAM Slots: 4, 168-pin DIMM	512 x 384	24-bit	24-bit	24-bit
Min - Max RAM: 8 MB - 256 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed: 70	640 x 480	16-bit	24-bit	24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	16-bit	24-bit	24-bit
Install in Groups of: 1	832 x 624	16-bit	24-bit	24-bit
Notes: 128MB DIMMs can be used, but have not been tested.	1024 x 768	8-bit	16-bit	24-bit
	1152 x 870	8-bit	16-bit	16-bit
	1280 x 1024	n/a-bit	8-bit	16-bit
Physical	Software		Storage	
Introduced: 4/22/1996	Addressing Modes: 32-bit		Floppy Size: 1.44MB	
Discontinued: n/a	Orig SSW: 7.5.3		Floppy Inject: manual	
Form Factor: PM 7500	Orig Enabler: none		Min. Int HD Size: 1.2GB	
Gestalt ID: 108	ROM ID: \$077D		Int HD Interface: SCSI	
Weight (lbs): 22	ROM Ver: \$28		Orig CD Speed: 4x	
Dimensions (in): 6.15 H x 14.37 W x 16.93 D	ROM Size: 4MB		Int CD Support: yes	
	AppleTalk Ver: 60.1.0			
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9			

# Mac mini (Early 2006) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Mac mini (Early 2006) - Technical Specifications

### Configurations

	1.5GHz Mac mini (MA205LL/A)	1.66GHz Mac mini (MA206LL/A)
Processor	1.5GHz Intel Core Solo	1.66GHz Intel Core Duo
L2 Cache	2MB Shared	
System bus	667MHz	
Memory	512MB of 667MHz DDR2 SDRAM (PC2-5300), supports up to 2GB	
Hard drive	60GB 5400-rpm Serial ATA <sup>2</sup>	80GB 5400-rpm Serial ATA
Optical drive	Slot-loading Combo drive (DVD-ROM/CD-RW)	Slot-loading SuperDrive with double-layer support (DVD+R DL/DVD±RW/CD-RW)
Graphics	Intel GMA950 graphics processor with 64MB of DDR2 SDRAM shared with main memory <sup>1</sup>	
Ports	One FireWire 400 port (8 watts); Four USB 2.0 ports (up to 480 Mbps); DVI output; VGA output (using included adapter); S-video and composite video output <sup>4</sup>	
Audio	Built-in speakers, combined optical digital audio input/audio line in, combined optical digital audio output/headphone out	
Networking	Built-in 10/100/1000BASE-T (Gigabit)	
Wireless	Built-in 54 Mbps AirPort Extreme Wi-Fi (802.11g) <sup>3</sup> ; built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module.	
Limited warranty and service	Your Mac mini comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	

### Technical Specifications

#### In the Box

- Mac mini
- Apple Remote
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

#### Processor and memory

- 1.5GHz Intel Core Solo or 1.66GHz Intel Core Duo processor
- 2MB on-chip L2 cache
- 667MHz frontside bus
- 512MB of 667MHz DDR2 SDRAM (PC2-5300) on two DIMMs; supports up to 2GB

#### Size and weight

- Height: 2 inches (5.08 cm)
- Width: 6.5 inches (16.51 cm)
- Depth: 6.5 inches (16.51 cm)
- Weight: 2.9 pounds (1.31 kg)

#### Peripheral connections

- One FireWire 400 port (8 watts)
- Four USB 2.0 ports (up to 480 Mbps)

#### Graphics and Video Support

- Intel GMA950 graphics processor with 64MB of DDR2 SDRAM shared with main memory<sup>1</sup>
- DVI video output to support digital resolutions up to 1920 by 1200 pixels; supports 20-inch Apple Cinema Display and 23-inch Apple Cinema HD Display; supports coherent digital displays up to 154MHz; supports noncoherent digital displays up to 135MHz
- VGA video output (using included adapter) to support analog resolutions up to 1920 by 1080 pixels
- S-video and composite video output to connect directly to a TV or projector (using Apple DVI to Video Adapter, sold separately)

#### Communications

- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard)

# 34\_Mac mini (Early 2006) - Technical Specifications.pdf

- Built-in Bluetooth 2.0 + Enhanced Data Rate (EDR) up to 3 Mbps
- Optional external Apple USB Modem

## Audio

- Built-in speaker
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)

## Storage

- 60GB or 80GB 5400-rpm Serial ATA hard disk drive; optional 100GB or 120GB drive<sup>2</sup>
- One of the following optical drives:
  - Slot-loading Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed
  - Slot-loading SuperDrive with double-layer support (DVD+R DL/DVD±RW/CD-RW): writes DVD+R DL discs at up to 2.4x speed, writes DVD-R and DVD+R discs at up to 8x speed, writes DVD-RW and DVD+RW discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 110W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork (30-day trial), Quicken 2006 for Macintosh, Big Bang Board Games, Comic Life, Omni Outliner, and Apple Hardware Test
- Front Row

## Options

### Configure to Order

- 80 GB hard drive (1.5GHz only)
- 100 GB hard drive
- 120 GB hard drive
- Up to 2GB of 667MHz DDR2 SDRAM
- Apple Wireless Keyboard (M9270LL/A)
- Apple Wireless Mouse (M9269Z/A)
- Apple USB Modem (MA034Z/A)

### Accessories

- AirPort Express Base Station (M9470LL/A)
- AirPort Extreme Base Station (M8799LL/A)
- Apple 8x DVD-R Media Kit (M9472G/A)
- Apple DVI to Video Adapter (M9267G/A)
- Apple FireWire Cable (M8706G/A)
- AppleCare Protection Plan (M8851LL/A)
- .Mac Subscription (M9888Z/A)
- iWork (MA222Z/A)

1. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 80MB, resulting in 432MB of system memory available.

2. 1GB = 1 billion bytes; actual formatted capacity less.

3. Wireless Internet access requires AirPort Express or AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.

4. Requires Apple DVI to Video Adapter, sold separately

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Internet access requires a compatible Internet service provider; fees may apply.

Product contains electronic documentation.

Backup copy of software is included.

Published Date: Apr 6, 2016

# Power Macintosh 7215/90: Technical Specifications

## Power Macintosh 7215/90

Logic Board		Ports		Power	
Processor:	601, 90	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 45	Floppy:	none	Voltage:	100-240
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	opt'l.	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatibility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (1x1MB)	Video Memory 4MB VRAM (3x1MB)
RAM Slots:	4, 168-pin DIMM	512 x 384	24-bit	24-bit	24-bit
Min - Max RAM:	16 MB - 256 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	70	640 x 480	16-bit	24-bit	24-bit
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	16-bit	24-bit	24-bit
Install in Groups of:	1	832 x 624	16-bit	24-bit	24-bit
Notes:	128MB DIMMs can be used, but have not been tested.	1024 x 768	8-bit	16-bit	24-bit
		1152 x 870	8-bit	16-bit	24-bit
		1280 x 1024	n/a-bit	8-bit	16-bit
Physical		Software		Storage	
Introduced:	1/11/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	J-7.5.2	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	System Enabler 701 v1.1	Min. Int HD Size:	800MB
Gestalt ID:	108	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$28	Orig CD Speed	4x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	60.0.6		
		Mac OS Supported:	7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		

# Macintosh Performa 6205CD:Technical Specifications

Macintosh Performa 6205CD

Logic Board	Ports	Power
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms> Notes:	Max Watts: 55 Amps: 1.25 BTU per Hr: 188.1 Voltage: 100-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	ResolutionVideo Memory 1MB DRAM (built in) 512 x 384n/a-bit 640 x 400n/a-bit 640 x 48016-bit 800 x 6008-bit 832 x 6248-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit  Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 8/28/1995 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# Power Macintosh 7220/200: Technical Specifications

## Power Macintosh 7220/200

Logic Board		Ports		Power	
Processor:	603e, 200	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 40	Floppy:	none	Voltage:	110/220
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	47-63 Hz
L2 Cache:	256K	Geoports:	2	Battery Type:	4.5V alkaline
2nd Processor:	none	Ethernet:	10baseT	Soft Power:	yes
Slots:	2 PCI, comm II	FireWire:			
Notes:	Supports one 7-inch and one 12-inch PCI slot.	Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB EDO DRAM (1x2MB)	Video Memory 4MB SGRAM (1x4MB)	
RAM Slots:	3, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	16 MB - 160 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	60	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	16-bit	24-bit	
Notes:	Uses JEDEC-standard 3.3-volt unbuffered EDO DIMM devices. DRAM slot 1 supports only single-bank DIMMs.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	16-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	2/17/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PM 4400	Orig Enabler:	System Enabler 827	Min. Int HD Size:	2GB
Gestalt ID:	515	ROM ID:	\$077D	Int HD Interface:	ATA
Weight (lbs):	24	ROM Ver:	\$3A	Orig CD Speed	8x
Dimensions (in):	5.43 H x 15.12 W x 17.37 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	60.1.1		
		Mac OS Supported:	7.5.3 7.6.1 8.0 8.1 8.5 9 8.6		

# Macintosh Performa 6210CD:Technical Specifications

Macintosh Performa 6210CD

Logic Board	Ports		Power	
Processor: 603, 75	USB:		Max Watts:	55
PMMU: integrated	ADB: 1		Amps:	1.25
FPU: integrated	Video: DB-15		BTU per Hr:	188.1
Data Path: 64, 37.5	Floppy: none		Voltage:	100-240
L1 Cache: 16K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache: 256K	Geoports:		Battery Type:	4.5V alkaline
2nd Processor: none	Ethernet: none		Soft Power:	yes
Slots: LC, comm, TV, video in/out	FireWire:			
	Mic Type: PlainTalk			
	AirPort Ready:			
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,			
	Sound Notes: INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>			
Memory	Video Memory			
Logic Board: none	Resolution	Video Memory 1MB DRAM (built in)		
RAM Slots: 2, 72-pin SIMM	512 x 384	n/a-bit		
Min - Max RAM: 16 MB - 64 MB	640 x 400	n/a-bit		
Min RAM Speed: 80	640 x 480	16-bit		
RAM Sizes: 4, 8, 16, 32 MB	800 x 600	8-bit		
Install in Groups of: 1	832 x 624	8-bit		
	1024 x 768	n/a-bit		
	1152 x 870	n/a-bit		
	1280 x 1024	n/a-bit		
	Notes: Video in not supported at 832x624.			
Physical	Software		Storage	
Introduced: 10/12/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued: n/a	Orig SSW:	J-7.5.1	Floppy Inject:	manual
Form Factor: Quadra 630	Orig Enabler:	System Enabler 406	Min. Int HD Size:	500, 800MB
Gestalt ID: 42	ROM ID:	\$077D	Int HD Interface:	IDE
Weight (lbs): 19	ROM Ver:	\$26	Orig CD Speed	4x
Dimensions (in): 4.3 H x 12.6 W x 16.5 D	ROM Size:	4MB	Int CD Support:	yes
Notes: This system is not sold in the U.S.	AppleTalk Ver:	58.1.3		
	Mac OS Supported:	7.5.1		
		7.5.3		
		7.5.5		
		7.6		
		7.6.1		
		8.0		

# Power Macintosh 7220/200 PC Compatible: Technical Specifications

## Power Macintosh 7220/200 PC Compatible

Logic Board	Ports	Power
Processor: 603e, 200	USB:	Max Watts: 150
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 513
Data Path: 64, 40	Floppy: none	Voltage: 110/220
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: Cyrix P166 6x86	Ethernet: 10baseT	Soft Power: yes
Slots: 2 PCI, comm II	FireWire:	
Notes: Supports one 7-inch and one 12-inch PCI slot. The 12-inch PCI slot is occupied by the PC Compatibility card.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker	
	Port Notes: Includes PC game port on PC Compatibility card.	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB EDO DRAM (1x2MB) Video Memory 4MB SGRAM (1x4MB)
RAM Slots: 3, 168-pin DIMM	512 x 384	24-bit 24-bit
Min - Max RAM: 32 MB - 160 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 60	640 x 480	24-bit 24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit 24-bit
Install in Groups of: 1	832 x 624	16-bit 24-bit
Notes: Uses JEDEC-standard 3.3-volt unbuffered EDO DIMM devices. DRAM slot 1 supports only single-bank DIMMs.	1024 x 768	16-bit 24-bit
	1152 x 870	16-bit 16-bit
	1280 x 1024	8-bit 16-bit
Physical	Software	Storage
Introduced: 4/4/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: PM 4400	Orig Enabler: System Enabler 827	Min. Int HD Size: 2GB
Gestalt ID: 515	ROM ID: \$077D	Int HD Interface: ATA
Weight (lbs): 24	ROM Ver: \$3A	Orig CD Speed: 12x
Dimensions (in): 5.43 H x 15.12 W x 17.37 D	ROM Size: 4MB	Int CD Support: yes
Notes: This system is not sold in the U.S.	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.5.3 7.6.1 8.0 8.1 8.5 8.6 9	
	Notes: Includes Windows 95 for use with PC Compatibility card.	



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# Macintosh Performa 6214CD:Technical Specifications

Macintosh Performa 6214CD

Logic Board	Ports	Power
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms> Notes:	Max Watts: 55 Amps: 1.25 BTU per Hr: 188.1 Voltage: 100-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	Resolution Video Memory 1MB DRAM (built in) 512 x 384 n/a-bit 640 x 400 n/a-bit 640 x 480 16-bit 800 x 600 8-bit 832 x 624 8-bit 1024 x 768 n/a-bit 1152 x 870 n/a-bit 1280 x 1024 n/a-bit  Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 8/28/1995 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# Power Macintosh 7300/166: Technical Specifications

## Power Macintosh 7300/166

Logic Board		Ports		Power	
Processor:	604e, 166	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 50	Floppy:	none	Voltage:	100-130/200-270
L1 Cache:	64K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatibility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	16 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	2/13/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.5	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	System Enabler 702	Min. Int HD Size:	2GB
Gestalt ID:	109	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$34	Orig CD Speed	12x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	60.1.1		
		Mac OS Supported:	7.5.5 7.6.1 8.0 8.1 8.5 8.6 9		

# Macintosh Performa 6216CD:Technical Specifications

Macintosh Performa 6216CD

Logic Board	Ports		Power																			
Processor: 603, 75	USB:		Max Watts:	55																		
PMMU: integrated	ADB: 1		Amps:	1.25																		
FPU: integrated	Video: DB-15		BTU per Hr:	188.1																		
Data Path: 64, 37.5	Floppy: none		Voltage:	100-240																		
L1 Cache: 16K	SCSI: DB-25		Freq Range:	50-60 Hz																		
L2 Cache: 256K	Geoports:		Battery Type:	4.5V alkaline																		
2nd Processor: none	Ethernet: none		Soft Power:	yes																		
Slots: LC, comm, TV, video in/out	FireWire:																					
	Mic Type:	PlainTalk																				
	AirPort Ready:																					
	Other Ports:	Printer Modem Speaker ,Headphone ,Remote Control ,																				
	Sound Notes:	INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>																				
Memory	Video Memory																					
Logic Board: none	<table><thead><tr><th>Resolution</th><th>Video Memory 1MB DRAM (built in)</th></tr></thead><tbody><tr><td>512 x 384</td><td>n/a-bit</td></tr><tr><td>640 x 400</td><td>n/a-bit</td></tr><tr><td>640 x 480</td><td>16-bit</td></tr><tr><td>800 x 600</td><td>8-bit</td></tr><tr><td>832 x 624</td><td>8-bit</td></tr><tr><td>1024 x 768</td><td>n/a-bit</td></tr><tr><td>1152 x 870</td><td>n/a-bit</td></tr><tr><td>1280 x 1024</td><td>n/a-bit</td></tr></tbody></table>				Resolution	Video Memory 1MB DRAM (built in)	512 x 384	n/a-bit	640 x 400	n/a-bit	640 x 480	16-bit	800 x 600	8-bit	832 x 624	8-bit	1024 x 768	n/a-bit	1152 x 870	n/a-bit	1280 x 1024	n/a-bit
Resolution					Video Memory 1MB DRAM (built in)																	
512 x 384					n/a-bit																	
640 x 400					n/a-bit																	
640 x 480					16-bit																	
800 x 600					8-bit																	
832 x 624					8-bit																	
1024 x 768					n/a-bit																	
1152 x 870					n/a-bit																	
1280 x 1024	n/a-bit																					
RAM Slots: 2, 72-pin SIMM																						
Min - Max RAM: 8 MB - 64 MB																						
Min RAM Speed: 80																						
RAM Sizes: 4, 8, 16, 32 MB																						
Install in Groups of: 1																						
Physical	Software		Storage																			
Introduced: 7/17/1995	Addressing Modes: 32-bit		Floppy Size:	1.44MB																		
Discontinued: n/a	Orig SSW: 7.5.1		Floppy Inject:	manual																		
Form Factor: Quadra 630	Orig Enabler: System Enabler 406		Min. Int HD Size:	1GB																		
Gestalt ID: 42	ROM ID: \$077D		Int HD Interface:	IDE																		
Weight (lbs): 19	ROM Ver: \$26		Orig CD Speed	4x																		
Dimensions (in): 4.3 H x 12.6 W x 16.5 D	ROM Size: 4MB		Int CD Support:	yes																		
	AppleTalk Ver: 58.1.3																					
	Mac OS Supported:																					
	7.5.1																					
	7.5.3																					
	7.5.5																					
7.6																						
7.6.1																						
8.0																						

# Macintosh Performa 6218CD:Technical Specifications

Macintosh Performa 6218CD

Logic Board	Ports	Power																		
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms> Notes:	Max Watts: 55 Amps: 1.25 BTU per Hr: 188.1 Voltage: 100-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes																		
Memory	Video Memory																			
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 16 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	Video Memory 1MB DRAM (built in) <table><tr><th>Resolution</th><th></th></tr><tr><td>512 x 384</td><td>n/a-bit</td></tr><tr><td>640 x 400</td><td>n/a-bit</td></tr><tr><td>640 x 480</td><td>16-bit</td></tr><tr><td>800 x 600</td><td>8-bit</td></tr><tr><td>832 x 624</td><td>8-bit</td></tr><tr><td>1024 x 768</td><td>n/a-bit</td></tr><tr><td>1152 x 870</td><td>n/a-bit</td></tr><tr><td>1280 x 1024</td><td>n/a-bit</td></tr></table> Notes: Video in not supported at 832x624.		Resolution		512 x 384	n/a-bit	640 x 400	n/a-bit	640 x 480	16-bit	800 x 600	8-bit	832 x 624	8-bit	1024 x 768	n/a-bit	1152 x 870	n/a-bit	1280 x 1024	n/a-bit
Resolution																				
512 x 384	n/a-bit																			
640 x 400	n/a-bit																			
640 x 480	16-bit																			
800 x 600	8-bit																			
832 x 624	8-bit																			
1024 x 768	n/a-bit																			
1152 x 870	n/a-bit																			
1280 x 1024	n/a-bit																			
Physical	Software	Storage																		
Introduced: 7/17/1995 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes																		

# Macintosh Performa 6220CD:Technical Specifications

Macintosh Performa 6220CD

Logic Board	Ports	Power
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms> Notes:	Max Watts: 55 Amps: 1.25 BTU per Hr: 188.1 Voltage: 100-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 16 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	ResolutionVideo Memory 1MB DRAM (built in) 512 x 384n/a-bit 640 x 400n/a-bit 640 x 48016-bit 800 x 6008-bit 832 x 6248-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 7/17/1995 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# iMac (Early 2006) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Configurations

	17-inch iMac (MA199LL)	20-inch iMac (MA200LL)
Processor	1.83GHz Intel Core Duo	2.0GHz Intel Core Duo
L2 Cache	2MB Shared	
System bus	667MHz	
Memory	512MB (single SODIMM) 667MHz DDR2 SDRAM (PC2-5300), supports up to 2GB	
Hard drive	160GB Serial ATA <sup>1</sup> ; 7200 rpm	250GB Serial ATA <sup>1</sup> ; 7200 rpm
Optical drive	Slot-loading 8x SuperDrive with 2.4x Dual Layer burn (DVD+R DL/DVD±RW/CD-RW)	
Display	17-inch (viewable) widescreen TFT active-matrix LCD, 1440 x 900 pixels, millions of colors	20-inch (viewable) widescreen TFT active-matrix LCD, 1680 x 1050 pixels, millions of colors
Video camera	Built-in iSight	
Graphics	ATI Radeon X1600 with 128MB GDDR3 memory	ATI Radeon X1600 with 128MB GDDR3 memory, with upgrade option to 256MB GDDR3 SDRAM
Ports	Two FireWire 400 ports; three USB 2.0 ports, two USB 1.1 ports (on keyboard); mini-DVI port; DVI output <sup>2</sup> ; VGA output <sup>2</sup> ; S-video and composite video output <sup>2</sup>	
Audio	Built-in stereo speakers, built-in microphone, headphone/optical digital audio output, audio line in	
Networking	Built-in 10/100/1000BASE-T (Gigabit)	
Wireless	Built-in 54 Mbps AirPort Extreme (802.11g) <sup>3</sup> ; built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module.	
Hardware accessories	Apple Remote, Apple Keyboard, Mighty Mouse	
Limited warranty and service	Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	

## Options

### Configure to Order

- Graphics memory upgrade to 256MB GDDR3 SDRAM (20" only)
- 250 GB hard drive (17" upgrade)
- 500 GB hard drive (20" upgrade)
- Up to 2GB of 667MHz DDR2 SDRAM
- Apple Wireless Keyboard
- Apple Wireless Mouse
- Apple USB Modem

### Accessories

- AirPort Express Base Station
- AirPort Extreme Base Station
- Apple 8x DVD-R Media Kit
- Apple mini-DVI to DVI Adapter
- Apple mini-DVI to VGA Adapter
- Apple mini-DVI to Video Adapter
- Apple FireWire Cable
- AppleCare Protection Plan
- .Mac Subscription
- iWork

## In the Box

- iMac

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- Apple Keyboard
- Mighty Mouse
- Apple Remote
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

## Processor and memory

- 1.83GHz or 2GHz Intel Core Duo processor
- 2MB shared L2 cache at full processor speed
- 667MHz system bus
- 512MB (single SODIMM) of PC2-5300 (667MHz) DDR2 memory; two SODIMM slots support up to 2GB

## Storage

- 160 or 250GB 7200-rpm Serial ATA hard disk drive
- 8x SuperDrive (DVD+R DL/DVD±RW/CD-RW) installed; writes DVD+R DL discs at up to 2.4x speed, writes DVD-R and DVD+R discs at up to 8x speed, writes DVD-RW and DVD+RW discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 24x speed

## Communications

- Built-in 54-Mbps AirPort Extreme Card (802.11g standard)
- Built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module
- Built-in 10/100/1000 Gigabit BASE-T Ethernet (RJ-45 connector)
- Works with 56K V.92 Apple USB Modem (sold separately)

## Display

- Built-in 17-inch (viewable) widescreen or 20-inch (viewable) widescreen TFT active-matrix liquid crystal display
- Millions of colors at all resolutions
- Typical viewing angle:
  - 17-inch model
    - 140° horizontal
    - 120° vertical
  - 20-inch model
    - 170° horizontal
    - 170° vertical
- Typical brightness: 250 cd/m (17-inch model); 280 cd/m (20-inch model)
- Typical contrast ratio: 500:1 (17-inch model); 800:1 (20-inch model)

## Graphics and Video

- ATI Radeon X1600 graphics processor using PCI Express
- 128 MB of GDDR3 video memory
- Mini-DVI output port with support for DVI, VGA, S-video, and composite video connections via adapter<sup>2</sup>
- Built-in iSight camera
- Support for external display in extended desktop
  - Digital resolutions up to 1920 x 1200
  - Analog resolutions up to 2045 x 1536
- Support for external display in video mirroring mode

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 180W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Size and weight (17-inch)



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- Height: 16.9 inches (43.0 cm)
- Width: 16.8 inches (42.6 cm)
- Depth: 6.8 inches (17.3 cm)
- Weight: 15.5 pounds (7 kg)<sup>4</sup>

## Size and weight (20-inch)

- Height: 18.6 inches (47.2 cm)
- Width: 19.4 inches (49.3 cm)
- Depth: 7.4 inches (18.9 cm)
- Weight: 22 pounds (10 kg)<sup>4</sup>

## Peripheral connections

- Two FireWire 400 ports; 8 watts shared
- Total of five USB ports: three USB 2.0 ports (up to 480 Mbps) on computer, two USB 1.1 ports on keyboard

## Audio

- Built-in stereo speakers
- Internal 12-watt digital amplifier
- Headphone/optical digital audio output
- Audio line input
- Built-in microphone

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork (30-day trial), Quicken 2006 for Macintosh, Big Bang Board Games, Comic Life, Omni Outliner, and Apple Hardware Test
- Front Row
- Photo Booth

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Requires adapter, sold separately.
  3. Wireless Internet access requires AirPort Express or AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.
  4. Weight varies by configuration and manufacturing process.
- 

- Intel and Intel Core are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.
- Internet access requires a compatible Internet service provider; fees may apply.
- Product contains electronic documentation.
- Backup copy of software is included.

Published Date: Apr 6, 2016

# Power Macintosh 7300/180: Technical Specifications

## Power Macintosh 7300/180

Logic Board		Ports		Power	
Processor:	604e, 180	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 45	Floppy:	none	Voltage:	100-130/200-270
L1 Cache:	64K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatibility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	16 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	2/17/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.5	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	System Enabler 702	Min. Int HD Size:	2GB
Gestalt ID:	109	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$34	Orig CD Speed	12x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.1		
		Mac OS Supported:	7.5.5 7.6.1 8.0 8.1 8.5 8.6 9		

# Macintosh Performa 6230CD:Technical Specifications

Macintosh Performa 6230CD

Logic Board	Ports	Power																		
Processor: 603, 75 PMMU: integrated FPU: integrated Data Path: 64, 37.5 L1 Cache: 16K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms> Notes:	Max Watts: 55 Amps: 1.25 BTU per Hr: 188.1 Voltage: 100-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes																		
Memory	Video Memory																			
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 16 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	<table><tr><th>Resolution</th><th>Video Memory 1MB DRAM (built in)</th></tr><tr><td>512 x 384</td><td>n/a-bit</td></tr><tr><td>640 x 400</td><td>n/a-bit</td></tr><tr><td>640 x 480</td><td>16-bit</td></tr><tr><td>800 x 600</td><td>8-bit</td></tr><tr><td>832 x 624</td><td>8-bit</td></tr><tr><td>1024 x 768</td><td>n/a-bit</td></tr><tr><td>1152 x 870</td><td>n/a-bit</td></tr><tr><td>1280 x 1024</td><td>n/a-bit</td></tr></table> Notes: Video in not supported at 832x624.	Resolution	Video Memory 1MB DRAM (built in)	512 x 384	n/a-bit	640 x 400	n/a-bit	640 x 480	16-bit	800 x 600	8-bit	832 x 624	8-bit	1024 x 768	n/a-bit	1152 x 870	n/a-bit	1280 x 1024	n/a-bit	
Resolution	Video Memory 1MB DRAM (built in)																			
512 x 384	n/a-bit																			
640 x 400	n/a-bit																			
640 x 480	16-bit																			
800 x 600	8-bit																			
832 x 624	8-bit																			
1024 x 768	n/a-bit																			
1152 x 870	n/a-bit																			
1280 x 1024	n/a-bit																			
Physical	Software	Storage																		
Introduced: 7/17/1995 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes																		

# Power Macintosh 7300/180 PC Compatible: Technical Specifications

## Power Macintosh 7300/180 PC Compatible

Logic Board	Ports	Power
Processor: 604e, 180	USB:	Max Watts: 150
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 513
Data Path: 64, 45	Floppy: none	100-
L1 Cache: 64K	SCSI: DB-25	Voltage: 130/200-270
L2 Cache: 256K	Geoports: 2	Freq Range: 50-60 Hz
2nd Processor: 166 MHz Pentium	Ethernet: AAUI, 10baseT	Battery Type: 3.6V lithium
Slots: 3 PCI	FireWire:	Soft Power: yes
Notes: Ships with a PC Compatibility card installed, which occupies one PCI slot.	Mic Type: PlainTalk	Pass Through: yes
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
	Port Notes: Includes PC game port on PC Compatibility card.	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB VRAM (2x1MB) Video Memory 4MB VRAM (4x1MB)
RAM Slots: 8, 168-pin DIMM	512 x 384	24-bit 24-bit
Min - Max RAM: 32 MB - 512 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 70	640 x 480	24-bit 24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit 24-bit
Install in Groups of: 1	832 x 624	24-bit 24-bit
Notes: 128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit 24-bit
	1152 x 870	16-bit 24-bit
	1280 x 1024	8-bit 16-bit
Physical	Software	Storage

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Introduced:	4/4/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.6.1	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	none	Min. Int HD Size:	2GB
Gestalt ID:	109	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$34	Orig CD Speed	12x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.1		
		Mac OS Supported:	7.5.5 7.6.1 8.0 8.1 8.5 8.6 9		
		Notes:	Includes Windows 95 for use with PC Compatibility card.		

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# Macintosh Performa 6260CD:Technical Specifications

Macintosh Performa 6260CD

Logic Board	Ports	Power
Processor: 603e, 100 PMMU: integrated FPU: integrated Data Path: 64, 40 L1 Cache: 32K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer, Modem, Speaker, Headphone, Remote Control, / Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	Max Watts: 55 Amps: 1.25 BTU per Hr: 188.1 Voltage: 100-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	ResolutionVideo Memory 1MB DRAM (built in) 512 x 384n/a-bit 640 x 400n/a-bit 640 x 48016-bit 800 x 6008-bit 832 x 6248-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 6/19/1996 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D Notes: This system is not sold in the U.S.	Addressing Modes: 32-bit Orig SSW: J-7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1, 7.5.3, 7.5.5, 7.6, 7.6.1, 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 800MB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# Power Macintosh 7300/200: Technical Specifications

## Power Macintosh 7300/200

Logic Board		Ports		Power	
Processor:	604e, 200	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 50	Floppy:	none	Voltage:	100-130/200-270
L1 Cache:	64K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatibility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	32 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	2/17/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.5	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	System Enabler 702	Min. Int HD Size:	2GB
Gestalt ID:	109	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$34	Orig CD Speed	12x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.1		
		Mac OS Supported:	7.5.5 8.0 7.6.1 8.5 8.1 8.6 9		

# Macintosh Performa 6290CD:Technical Specifications

Macintosh Performa 6290CD

Logic Board	Ports		Power	
Processor: 603e, 100	USB:		Max Watts:	55
PMMU: integrated	ADB: 1		Amps:	1.25
FPU: integrated	Video: DB-15		BTU per Hr:	188.1
Data Path: 64, 40	Floppy: none		Voltage:	100-240
L1 Cache: 32K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache: 256K	Geoports:		Battery Type:	4.5V alkaline
2nd Processor: none	Ethernet: none		Soft Power:	yes
Slots: LC, comm, TV, video in/out	FireWire:			
	Mic Type:	PlainTalk		
	AirPort Ready:			
	Other Ports:	Printer Modem Speaker ,Headphone ,Remote Control ,		
	Sound Notes:	INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>		
Memory	Video Memory			
Logic Board: none	Video Memory			
RAM Slots:	2, 72-pin SIMM	Resolution	1MB DRAM (built in)	
		512 x 384	n/a-bit	
Min - Max RAM:	8 MB - 64 MB	640 x 400	n/a-bit	
		640 x 480	16-bit	
Min RAM Speed:	80	800 x 600	8-bit	
		832 x 624	8-bit	
RAM Sizes:	4, 8, 16, 32 MB	1024 x 768	n/a-bit	
		1152 x 870	n/a-bit	
Install in Groups of:	1	1280 x 1024	n/a-bit	
		Notes: Video in not supported at 832x624.		
Physical	Software		Storage	
Introduced: 1/27/1996	Addressing Modes: 32-bit		Floppy Size:	1.44MB
Discontinued: n/a	Orig SSW: 7.5.1		Floppy Inject:	manual
Form Factor: Quadra 630	Orig Enabler: System Enabler 406		Min. Int HD Size:	1.2GB
Gestalt ID: 42	ROM ID: \$077D		Int HD Interface:	IDE
Weight (lbs): 19	ROM Ver: n/a		Orig CD Speed	4x
Dimensions (in): 4.3 H x 12.6 W x 16.5 D	ROM Size: 4MB		Int CD Support:	yes
	AppleTalk Ver: 58.1.3			
	Mac OS Supported:			
	7.5.1			
	7.5.3			
	7.5.5			
7.6				
7.6.1				
8.0				



# Power Macintosh 7500/100: Technical Specifications

## Power Macintosh 7500/100

Logic Board		Ports		Power	
Processor:	601, 100	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 50	Floppy:	none	Voltage:	100-
L1 Cache:	32K	SCSI:	DB-25		125/200-240
L2 Cache:	opt'l.	Geoports:	2	Freq Range:	50-60 Hz
2nd Processor:	opt. PC Compatbility Card	Ethernet:	AAUI, 10baseT	Battery Type:	3.6V lithium
Slots:	3 PCI	FireWire:		Soft Power:	yes
		Mic Type:	PlainTalk	Pass Through:	yes
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
		Port Notes:	Includes S-video and RCA ports for video in. Includes RCA ports for sound in and out.		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	8 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	8/8/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	5/18/1996	Orig SSW:	7.5.2	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	System Enabler 701 v1.2	Min. Int HD Size:	500MB-1GB
Gestalt ID:	68	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$28	Orig CD Speed	4x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.0.6		
		Mac OS Supported:	7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		

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# Macintosh Performa 6300CD:Technical Specifications

Macintosh Performa 6300CD

Logic Board	Ports	Power
Processor: 603e, 100 PMMU: integrated FPU: integrated Data Path: 64, 40 L1 Cache: 32K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms> Notes:	Max Watts: 55 Amps: 1.25 BTU per Hr: 188.1 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 16 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	Resolution Video Memory 1MB DRAM (built in) 512 x 384 n/a-bit 640 x 400 n/a-bit 640 x 480 16-bit 800 x 600 8-bit 832 x 624 8-bit 1024 x 768 n/a-bit 1152 x 870 n/a-bit 1280 x 1024 n/a-bit Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 10/16/1995 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1.2GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# Power Macintosh 7600/120: Technical Specifications

## Power Macintosh 7600/120

Logic Board		Ports		Power	
Processor:	604, 120	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 40	Floppy:	none	Voltage:	100-125/200-240
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatbility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
		Port Notes:	Includes S-video and RCA ports for video in. Includes RCA ports for sound in and out.		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	8 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	4/22/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	none	Min. Int HD Size:	1.2GB
Gestalt ID:	68	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$28	Orig CD Speed	4x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.0		
		Mac OS Supported:	7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		

# Macintosh Performa 6310CD:Technical Specifications

Macintosh Performa 6310CD

Logic Board	Ports	Power
Processor: 603e, 100 PMMU: integrated FPU: integrated Data Path: 64, 40 L1 Cache: 32K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer, Modem, Speaker, Headphone, Remote Control, / Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms>	Max Watts: 55 Amps: 1.25 BTU per Hr: 188.1 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 16 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	Video Memory Resolution1MB DRAM (built in) 512 x 384n/a-bit 640 x 400n/a-bit 640 x 48016-bit 800 x 6008-bit 832 x 6248-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 2/14/1996 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D Notes: This system is not sold in the U.S.	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: \$26 ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1, 7.5.3, 7.5.5, 7.6, 7.6.1, 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1.2GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# MacBook Pro (original) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Configurations

	15.4-inch: 1.83GHz (MA463LL/A)	15.4-inch: 2.0GHz (MA464LL/A)
<b>Processor</b>	1.83GHz Intel Core Duo	2.0GHz Intel Core Duo
<b>Memory</b>	512MB (single SODIMM) 667MHz DDR2 SDRAM (PC2-5300)	1GB (single SODIMM) 667MHz DDR2 SDRAM (PC2-5300)
<b>Display</b>	15.4-inch (diagonal), 1440 x 900 resolution, TFT widescreen	
<b>PCI Express Graphics</b>	ATI Mobility Radeon X1600 with 128MB of GDDR3 SDRAM and dual-link DVI	ATI Mobility Radeon X1600 with 256MB of GDDR3 SDRAM and dual-link DVI
<b>Video</b>	Built-in iSight Camera, DVI, VGA (DVI to VGA adapter included)	
<b>Audio</b>	Combined optical digital input/audio line in, combined optical digital output/headphone out, stereo speakers, microphone	
<b>Hard disk drive</b> <sup>(2)</sup>	80GB Serial ATA/100; 5400 rpm	100GB Serial ATA/100; 5400 rpm
<b>Slot-loading optical drive</b>	SuperDrive (DVD±RW/CD-RW)	
<b>Ethernet</b>	Built-in 10/100/1000BASE-T (Gigabit)	
<b>Wireless</b> <sup>(3)</sup>	Built-in 54-Mbps AirPort Extreme (802.11g standard); built-in Bluetooth 2.0+EDR	
<b>Modem</b>	Apple USB Modem (sold separately)	
<b>Input</b>	Apple Remote; full-size, illuminated keyboard with ambient light sensor; Scrolling Trackpad	
<b>Expansion</b>	One FireWire 400, two USB 2.0 ports, and ExpressCard/34 slot	
<b>Weight</b>	5.6 pounds	
<b>Footprint</b>	14.1 x 9.6 inches	
<b>Thickness</b>	1.0 inch (2.59 cm)	
<b>Video accessories</b>	DVI to VGA adapter included (other adapters sold separately)	
<b>Hardware accessories</b>	85W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery	
<b>Limited warranty and service</b>	Your MacBook Pro comes with 90 days of telephone support and a one-year limited warranty. For more information, visit Apple support or call 800-823-2775.	

## Options

- AirPort Extreme
- AirPort Express
- Apple DVI to Video Adapter
- Apple MagSafe Power Adapter
- Rechargeable Battery, 15-inch MacBook Pro
- iWork
- Up to 2GB main memory
- 100GB 5400-rpm, 100GB 7200-rpm, 120GB 5400-rpm hard drive (3)
- Apple Wireless Keyboard
- Apple USB Modem
- Apple Wireless Mouse
- Apple Keyboard
- Apple Mighty Mouse
- .Mac Subscription
- AppleCare Protection Plan

## In the box

- MacBook Pro
- MagSafe Power Adapter, AC wall plug and power cord
- Lithium-polymer battery
- Apple Remote
- DVI to VGA adapter
- Install/restore DVDs

# 36\_MacBook Pro (original) - Technical Specifications.pdf

- Printed and electronic documentation

## Processor and Memory

- 1.83 or 2.0GHz Intel Core Duo processor, 2MB on chip shared L2 cache running 1:1 with processor speed (2.16GHz processor available as custom configuration on 2.0GHz model)
- 512MB (single SODIMM) of PC2-5300 (667MHz) DDR2 memory on 1.83GHz configuration; and 1GB (single SODIMM) on 2.0GHz configuration; two SODIMM slots support up to 2GB
- 667MHz frontside bus

## Expansion

- One FireWire 400 port at up to 400 Mbps
- Two 480-Mbps USB 2.0 ports
- ExpressCard/34 slot

## Security

- Kensington cable lock slot

## Battery and power

- 60-watt-hour lithium-polymer battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life<sup>(1)</sup>
- 85W MagSafe Power Adapter with cable management system
- MagSafe Power Adapter port

## Communications

- Built-in 54-Mbps AirPort Extreme (802.11g standard<sup>(3)</sup>)
- Built-in Bluetooth 2.0+EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Combined optical digital input/audio line in (minijack)
- Combined optical digital output/headphone out (minijack)
- Built-in stereo speakers
- Internal omnidirectional microphone (located under left speaker grille)

## Video and graphics support

- ATI Mobility Radeon X1600 graphics processor, dual link DVI support, 128MB of GDDR3 on 1.83GHz configuration. 256MB GDDR3 on 2.0GHz configuration
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- DVI output port
- VGA output using included DVI to VGA adapter
- Built-in iSight camera

## Storage

- 80GB 5400-rpm Serial ATA hard drive on 1.83GHz configuration. Optional 100GB 5400-rpm, 100GB 7200-rpm, 120GB 5400-rpm drives<sup>(3)</sup>.
- 100GB 5400-rpm Serial ATA hard drive on 2.0GHz configuration. Optional 100GB 7200-rpm or 120GB 5400-rpm hard drives.
- 4x Slot-loading SuperDrive (DVD±RW/CD-RW)
  - Maximum Write: 4x DVD-R, DVD+R, DVD+RW, and DVD-RW; 24x CD-R; 10x CD-RW
  - Maximum Read: 8x DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R, DVD+R, DVD+RW, DVD-RW; 4x DVD+R (double layered) and DVD-R (double layered); 24x CD

## Display

- 15.4-inch (diagonal) TFT display, support for millions of colors
- Supported resolutions: 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 at 16:10 aspect ratio; 1024 by

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768, 800 by 600, and 640 by 480 at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 at 4:3 aspect ratio stretched; 720 by 480 at 3:2 aspect ratio, 720 by 480 at 3:2 aspect ratio stretched

## Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded numeric keypad
  - Backlit keyboard with ambient light sensors for automatic adjustment of keyboard illumination and screen brightness
- Solid-state scrolling Trackpad for precise cursor control; supports two finger scrolling, tap, double-tap, and drag capabilities
- Apple Remote included

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- DC input: 18.5 Vdc, 4.6 A max.
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and weight

- Height: 1.0 inch (2.59 cm)
- Width: 14.1 inches (35.7 cm)
- Depth: 9.6 inches (24.3 cm)
- Weight: 5.6 pounds (2.54 kg) with battery and optical drive installed <sup>(4)</sup>

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD, iWeb, GarageBand), Microsoft Office 2004 for Mac Test Drive, iWork '06 (30-day trial), QuickBooks for Mac New User Edition, Comic Life, FileMaker Pro trial, Omni Outliner
- Photo Booth
- Front Row

- 
1. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 80MB, resulting in 432MB of system memory available.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Wireless Internet access requires base station or other wireless access point and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme or AirPort Express Base Station. Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.
  4. Actual weight varies by configuration and manufacturing process.
- 

- Intel and Intel Core are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.
- Internet access requires a compatible Internet service provider; fees may apply.
- Product contains electronic documentation.
- Backup copy of software is included.

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# Power Macintosh 7600/132: Technical Specifications

## Power Macintosh 7600/132

Logic Board		Ports		Power	
Processor:	604, 132	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 44	Floppy:	none	Voltage:	100-125/200-240
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatbility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
		Port Notes:	Includes S-video and RCA ports for video in. Includes RCA ports for sound in and out.		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	8 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	8/3/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler:	none	Min. Int HD Size:	1.2GB
Gestalt ID:	68	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver:	\$28	Orig CD Speed	8x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.0		
		Mac OS Supported:	7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		

# Macintosh Performa 6320CD:Technical Specifications

Macintosh Performa 6320CD

Logic Board	Ports	Power
Processor: 603e, 120 PMMU: integrated FPU: integrated Data Path: 64, 40 L1 Cache: 32K L2 Cache: 256K 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV rms, max. input level 1.8 V rms> Notes:	Max Watts: 55 Amps: 1.25 BTU per Hr: 188.1 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 16 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	ResolutionVideo Memory 1MB DRAM (built in) 512 x 384n/a-bit 640 x 400n/a-bit 640 x 48016-bit 800 x 6008-bit 832 x 6248-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit  Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 4/22/1996 Discontinued: n/a Form Factor: Quadra 630 Gestalt ID: 42 Weight (lbs): 19 Dimensions (in): 4.3 H x 12.6 W x 16.5 D	Addressing Modes: 32-bit Orig SSW: 7.5.1 Orig Enabler: System Enabler 406 ROM ID: \$077D ROM Ver: n/a ROM Size: 4MB AppleTalk Ver: 58.1.3 Mac OS Supported: 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1.2GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes

# Power Macintosh 7600/200: Technical Specifications

## Power Macintosh 7600/200

Logic Board		Ports		Power	
Processor:	604e, 200	USB:		Max Watts:	150
PMMU:	integrated	ADB: 1		Amps:	3
FPU:	integrated	Video: DB-15		BTU per Hr:	513
Data Path:	64, 50	Floppy: none		Voltage:	100-125/200-240
L1 Cache:	64K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports: 2		Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatbility Card	Ethernet: AAUI, 10baseT		Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
		Port Notes: Includes S-video and RCA ports for video in. Includes RCA ports for sound in and out.			
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	32 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
Physical		Software		Storage	
Introduced:	2/17/1997	Addressing Modes: 32-bit		Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW: 7.5.5		Floppy Inject:	manual
Form Factor:	PM 7500	Orig Enabler: System Enabler 702		Min. Int HD Size:	2GB
Gestalt ID:	68	ROM ID: \$077D		Int HD Interface:	SCSI
Weight (lbs):	22	ROM Ver: \$34		Orig CD Speed	12x
Dimensions (in):	6.15 H x 14.37 W x 16.93 D	ROM Size: 4MB		Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver: 60.1.1			
		Mac OS Supported: 7.5.5 7.6.1 8.0 8.5 8.1 8.6 9			

# Macintosh Performa 6360: Technical Specifications

Macintosh Performa 6360

Logic Board	Ports	Power
Processor: 603e, 160	USB:	Max Watts: 150
PMMU: integrated	ADB: 1	Amps: 5
FPU: integrated	Video: DB-15	BTU per Hr: 513
Data Path: 64, 40	Floppy: none	Voltage: 90-270
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: opt'l.	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatbility Card	Ethernet: none	Soft Power: yes
Slots: PCI, comm, TV, video in/out	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution Video Memory 1MB DRAM (built in)	
RAM Slots: 2, 168-pin DIMM	512 x 384 n/a-bit	
Min - Max RAM: 16 MB - 136 MB	640 x 400 n/a-bit	
Min RAM Speed: 70	640 x 480 16-bit	
RAM Sizes: 8, 16, 32, 64 MB	800 x 600 16-bit	
Install in Groups of: 1	832 x 624 8-bit	
	1024 x 768 8-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
	Notes: Video in not supported at 832x624.	
Physical	Software	Storage
Introduced: 10/1/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: Quadra 630	Orig Enabler: System Enabler 410	Min. Int HD Size: 1.2GB
Gestalt ID: 58	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 17	ROM Ver: n/a	Orig CD Speed 8x
Dimensions (in): 4.3 H x 12.6 W x 16.5 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS 7.5.3	
	Supported: 7.5.5	
	7.6	
	7.6.1	
	8.0	

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# Power Macintosh 8100/80: Technical Specifications

## Power Macintosh 8100/80

Logic Board		Ports		Power	
Processor:	601, 80	USB:		Max Watts:	200
PMMU:	integrated	ADB: 1		Amps:	9
FPU:	integrated	Video: DB-15, HDI-45		BTU per Hr:	684
Data Path:	64, 40	Floppy:		Voltage:	100-240
L1 Cache:	32K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports: 2		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet: AAUI-15		Soft Power:	yes
Slots:	3 NuBus, PDS filled	FireWire:		Pass Through:	yes
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
Memory		Video Memory			
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)	Video Memory 2MB VRAM (built in)	Video Memory 4MB VRAM (4x512K)
RAM Slots:	8, 72-pin SIMM	512 x 384	16-bit	24-bit	24-bit
Min - Max RAM:	8 MB - 264 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	80	640 x 480	16-bit	24-bit	24-bit
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	n/a-bit	n/a-bit	n/a-bit
Install in Groups of:	2	832 x 624	8-bit	24-bit	24-bit
		1024 x 768	n/a-bit	16-bit	24-bit
		1152 x 870	n/a-bit	16-bit	24-bit
		1280 x 1024	n/a-bit	n/a-bit	n/a-bit
Physical		Software		Storage	
Introduced:	3/14/1994	Addressing Modes: 32-bit		Floppy Size:	1.44MB
Discontinued:	1/3/1995	Orig SSW: 7.1.2		Floppy Inject:	manual
Form Factor:	Quadra 800	Orig Enabler: PowerPC Enabler v1.0		Min. Int HD Size:	250MB-1GB
Gestalt ID:	65	ROM ID: \$077D		Int HD Interface:	SCSI
Weight (lbs):	25.3	ROM Ver: \$A4		Orig CD Speed	2x
Dimensions (in):	14 H x 7.7 W x 15.75 D	ROM Size: 4MB		Int CD Support:	yes
		AppleTalk Ver: 58.0.2			
		Mac OS Supported: 7.1.2 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9			

# Power Macintosh 8100/80AV: Technical Specifications

## Power Macintosh 8100/80AV

Logic Board	Ports	Power
Processor: 601, 80	USB:	Max Watts: 200
PMMU: integrated	ADB: 1	Amps: 9
FPU: integrated	Video: DB-15, HDI-45	BTU per Hr: 684
Data Path: 64, 40	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: none	Ethernet: AAUI-15	Soft Power: yes
Slots: 3 NuBus, PDS filled	FireWire:	Pass Through: yes
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
	Port Notes: Includes S-video ports for video in and out. RCA ports available via included adapter.	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)
RAM Slots: 8, 72-pin SIMM		Video Memory 2MB VRAM (built in)
Min - Max RAM: 8 MB - 264 MB	512 x 384	16-bit
Min RAM Speed: 80	640 x 400	n/a-bit
RAM Sizes: 4, 8, 16, 32 MB	640 x 480	16-bit
Install in Groups of: 2	800 x 600	n/a-bit
	832 x 624	8-bit
	1024 x 768	n/a-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 3/14/1994	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: 1/3/1995	Orig SSW: 7.1.2	Floppy Inject: manual
Form Factor: Quadra 800	Orig Enabler: PowerPC Enabler v1.0	Min. Int HD Size: 250MB-1GB
Gestalt ID: 65	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 25.3	ROM Ver: \$A4	Orig CD Speed: 2x
Dimensions (in): 14 H x 7.7 W x 15.75 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.0.2	
	Mac OS Supported: 7.1.2 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	

# Macintosh Performa 6400/180: Technical Specifications

## Macintosh Performa 6400/180

Logic Board	Ports	Power
Processor: 603e, 180	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: opt.	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatibility Card	Ethernet: none	Soft Power: yes
Slots: 2 PCI, Comm II, TV, video in	FireWire:	Pass Through: yes
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 168-pin DIMM		
Min - Max RAM: 16MB - 136 MB	512 x 384	n/a-bit
Min RAM Speed: 70	640 x 400	n/a-bit
RAM Sizes: 8, 16, 32, 64 MB	640 x 480	16-bit
Install in Groups of: 1	800 x 600	16-bit
	832 x 624	8-bit
	1024 x 768	8-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 8/5/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: Performa 6400	Orig Enabler: System Enabler 410 v1.1	Min. Int HD Size: 1.6GB
Gestalt ID: 58	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 44.5	ROM Ver: \$29	Orig CD Speed 8x
Dimensions (in): 16 H x 7.8 W x 16.9 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.1.5	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0	

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# Power Macintosh 8100/100: Technical Specifications

## Power Macintosh 8100/100

Logic Board		Ports		Power	
Processor:	601, 100	USB:		Max Watts:	200
PMMU:	integrated	ADB: 1		Amps:	9
FPU:	integrated	Video: DB-15, HDI-45		BTU per Hr:	684
Data Path:	64, 33.3	Floppy: none		Voltage:	100-240
L1 Cache:	32K	SCSI: DB-25		Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports: 2		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet: AAUI-15		Soft Power:	yes
Slots:	3 NuBus, PDS filled	FireWire:		Pass Through:	yes
		Mic Type: PlainTalk			
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,			
Memory		Video Memory			
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)	Video Memory 2MB VRAM (built in)	Video Memory 4MB VRAM (4x512K)
RAM Slots:	8, 72-pin SIMM	512 x 384	16-bit	24-bit	24-bit
Min - Max RAM:	8 MB - 264 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	80	640 x 480	16-bit	24-bit	24-bit
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	n/a-bit	n/a-bit	n/a-bit
Install in Groups of:	2	832 x 624	8-bit	24-bit	24-bit
		1024 x 768	n/a-bit	16-bit	24-bit
		1152 x 870	n/a-bit	16-bit	24-bit
		1280 x 1024	n/a-bit	n/a-bit	n/a-bit
Physical		Software		Storage	
Introduced:	1/3/1995	Addressing Modes: 32-bit		Floppy Size:	1.44MB
Discontinued:	10/14/1995	Orig SSW: 7.5		Floppy Inject:	manual
Form Factor:	Quadra 800	Orig Enabler: PowerPC Enabler v1.1.1		Min. Int HD Size:	700MB-1GB
Gestalt ID:	55	ROM ID: \$077D		Int HD Interface:	SCSI
Weight (lbs):	25.3	ROM Ver: \$23		Orig CD Speed	2x
Dimensions (in):	14 H x 7.7 W x 15.75 D	ROM Size: 4MB		Int CD Support:	yes
		AppleTalk Ver: n/a			
		Mac OS 7.5			
		Supported: 7.5.1			
		7.5.3			
		7.5.5			
		7.6			
		7.6.1			
		8.0			
		8.5			
		8.1			
		8.6			
		9			



# Power Macintosh 8100/100AV: Technical Specifications

## Power Macintosh 8100/100AV

Logic Board	Ports	Power
Processor: 601, 100 PMMU: integrated FPU: integrated Data Path: 64, 33.3 L1 Cache: 32K L2 Cache: 256K 2nd Processor: none Slots: 3 NuBus, PDS filled	USB: ADB: 1 Video: DB-15, HDI-45 Floppy: none SCSI: DB-25 Geoports: 2 Ethernet: AAUI-15 FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker , Port Notes: Includes S-video ports for video in and out. RCA ports available via included adapter.	Max Watts: 200 Amps: 9 BTU per Hr: 684 Voltage: 100-240 Freq Range: 50-60 Hz Battery Type: 3.6V lithium Soft Power: yes Pass Through: yes
Memory	Video Memory	
Logic Board: 8 MB RAM Slots: 8, 72-pin SIMM Min - Max RAM: 8 MB - 264 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 2	Resolution	Video Memory DRAM (HDI-45) (built in) Video Memory 2MB VRAM (built in)
	512 x 384	16-bit 24-bit
	640 x 400	n/a-bit 24-bit
	640 x 480	16-bit 24-bit
	800 x 600	n/a-bit 24-bit
	832 x 624	8-bit 24-bit
	1024 x 768	n/a-bit 16-bit
	1152 x 870	n/a-bit 16-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 1/3/1995 Discontinued: 8/5/1995 Form Factor: Quadra 800 Gestalt ID: 55 Weight (lbs): 25.3 Dimensions (in): 14 H x 7.7 W x 15.75 D	Addressing Modes: 32-bit Orig SSW: 7.5 Orig Enabler: PowerPC Enabler v1.1.1 ROM ID: \$077D ROM Ver: \$23 ROM Size: 4MB AppleTalk Ver: n/a Mac OS Supported: 7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1GB Int HD Interface: SCSI Orig CD Speed: 2x Int CD Support: yes

# Macintosh Performa 6400/200:Technical Specifications

Macintosh Performa 6400/200

Logic Board	Ports	Power
Processor: 603e, 200	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatibility Card	Ethernet: none	Soft Power: yes
Slots: 2 PCI, Comm II, TV, video in	FireWire:	Pass Through: yes
Notes: Some systems come with the Avid Cinema card, which occupies one PCI slot.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution	Video Memory 1MB DRAM (built in)
RAM Slots: 2, 168-pin DIMM	512 x 384	n/a-bit
Min - Max RAM: 16 MB - 136 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	16-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	16-bit
Install in Groups of: 1	832 x 624	8-bit
	1024 x 768	8-bit
	1152 x 870	n/a-bit
	1280 x 1024	n/a-bit
Physical	Software	Storage
Introduced: 8/5/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: Performa 6400	Orig Enabler: System Enabler 410 v1.1	Min. Int HD Size: 2.4GB
Gestalt ID: 58	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 44.5	ROM Ver: \$29	Orig CD Speed 8x
Dimensions (in): 16 H x 7.8 W x 16.9 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 58.1.5	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0	

# Power Mac G5 (Late 2005) - Technical Specifications

This article has been archived and is no longer updated by Apple.

Configurations	Power Mac G5 Dual 2GHz	Power Mac G5 Dual 2.3GHz	Power Mac G5 Quad 2.5GHz
Model	M9590LL/A	M9591LL/A	M9592LL/A
Processor	Dual-core 2GHz PowerPC G5	Dual-core 2.3GHz PowerPC G5	Two dual-core 2.5GHz PowerPC G5
L2 cache	1MB per core		
Frontside bus	1GHz	1.15GHz	1.25GHz per processor
Main memory	512MB of 533MHz DDR2 SDRAM (PC2-4200); supports up to 16GB		
Standard graphics	NVIDIA GeForce 6600 LE with 128MB of GDDR SDRAM, one single-link DVI port, and one dual-link DVI port	NVIDIA GeForce 6600 with 256MB of GDDR SDRAM, one single-link DVI port, and one dual-link DVI port	
Optional graphics	NVIDIA GeForce 7800 GT with 256MB of GDDR3 SDRAM, one single-link DVI port, and one dual-link DVI port; or NVIDIA Quadro FX 4500 with 512MB of GDDR3 SDRAM, two dual-link DVI ports, and one stereo 3D port (occupies PCI Express 16-lane slot and adjacent four-lane slot)		
Hard drive (1)	160GB Serial ATA; 7200 rpm	250GB Serial ATA; 7200 rpm	
Optical drive	16x SuperDrive with double-layer support (DVD+R DL/DVD±RW/CD-RW)		
Expansion (2)	Three open PCI Express expansion slots: two four-lane slots and one eight-lane slot		
Ports and Bays	One FireWire 800 port, two FireWire 400 ports (one on front), four USB 2.0 ports (one on front), two USB 1.1 ports (on keyboard), two internal hard drive bays (one occupied)		
Audio	Optical digital audio input, optical digital audio output, analog line-level input, analog line-level output, front headphone minijack and speaker		
Networking	Dual 10/100/1000BASE-T (Gigabit) Ethernet ports; integrated wireless antenna; optional AirPort Extreme and Bluetooth 2.0 + EDR (build-to-order option or through an Apple Authorized Service Provider)		
Software	Mac OS X, Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie HD, iDVD, and GarageBand), iCal, DVD Player, Classic environment, Art Directors Toolkit X, FileMaker Pro Trial, GraphicConverter, Microsoft Office 2004 for Mac Test Drive, OmniGraffle, OmniOutliner, QuickBooks New User Edition, Zinio Reader, Xcode Development Tools		
Hardware accessories	Apple Keyboard, Mighty Mouse, USB keyboard extension cable, DVI to VGA adapter		
Limited warranty and service	Your Power Mac G5 comes with 90 days of telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.		

Build to Order Options	
Order a custom-configured Power Mac G5 from the online Apple Store or an authorized Apple reseller.	
Memory	PC2-4200 DDR2 SDRAM (NECC) installed in pairs: 512MB, 1GB, 2GB, 4GB, 8GB, or 16GB; 1GB or more available in choice of ECC or NECC
Graphics	NVIDIA GeForce 6600 LE with 128MB of GDDR SDRAM NVIDIA GeForce 6600 with 256MB of GDDR SDRAM NVIDIA GeForce 7800 GT with 256MB of GDDR3 SDRAM NVIDIA Quadro FX 4500 with 512MB of GDDR3 SDRAM (occupies 16-lane PCI Express slot and adjacent four-lane PCI Express slot)
Hard drives (1)	160GB Serial ATA 250GB Serial ATA One or two 500GB Serial ATA
Displays	20-inch Apple Cinema Display M9177LL/A 23-inch Apple Cinema HD Display M9178LL/A 30-inch Apple Cinema HD Display M9179LL/A
Audio	Apple iPod Logitech Z-5500 5.1 THX Speaker SystemTB825LL/A Monster 1m Toslink Digital Fiber Optic Cable T7153LL/A Monster 2m Toslink Digital Fiber Optic Cable T7154LL/A
External storage	Xserve RAID Apple Fibre Channel PCI Express Card MA139G/A

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Wireless	AirPort Extreme and Bluetooth technologies AirPort Extreme Base Station M8799LL/A AirPort Express Base Station Featuring AirTunes M9470LL/A Apple Wireless Keyboard M9270LL/A (3) Apple Wireless Mouse M9269Z/A (3)
Services	AppleCare Protection Plan M8850LL/A .Mac Subscription MA175Z/A

Technical Specifications

Processing

- Single 2GHz, single 2.3GHz, or dual 2.5GHz dual-core PowerPC G5 microprocessors
- PowerPC processor architecture with 64-bit data paths and registers; each core includes:
  - 1MB on-chip L2 cache running at processor speed (total 2MB per processor)
  - Parallel data structure supporting up to 215 simultaneous in-flight instructions
  - Simultaneous issue of up to 10 out-of-order operations
  - Dual-pipeline Velocity Engine for 128-bit single-instruction, multiple-data (SIMD) processing
  - Two independent double-precision floating-point units
  - Advanced three-component branch prediction logic
- Native support for 32-bit application code
- Single 1GHz, single 1.15GHz, or dual 1.25GHz 64-bit DDR bidirectional frontside buses
- Point-to-point system controller

Memory

- 128-bit memory controller and data paths
  - 512MB of 533MHz DDR2 SDRAM (PC2-4200)
  - Eight DIMM slots supporting up to 16GB of main memory
- Support for the following DIMMs (in pairs):
  - 256MB DIMMs (64-bit-wide, 512-Mbit)
  - 512MB DIMMs (64-bit-wide, 512-Mbit)
  - 1GB DIMMs (64-bit-wide, 512-Mbit or 1-Gbit)
  - 2GB DIMMs (64-bit-wide, 1-Gbit)
- ECC memory available in configurations with 1GB or more (build-to-order option)

PCI Express expansion (2)

- Two open full-length four-lane PCI Express slots
- One open full-length eight-lane PCI Express slot
- PCI Express cards of any size supported in all slots

Graphics and displays

- 16-lane PCI Express graphics slot with one of the following graphics cards installed:
  - NVIDIA GeForce 6600 LE with 128MB of GDDR SDRAM, one single-link DVI port, and one dual-link DVI port
  - NVIDIA GeForce 6600 with 256MB of GDDR SDRAM, one single-link DVI port, and one dual-link DVI port
  - NVIDIA GeForce 7800 GT with 256MB of GDDR3 SDRAM, one single-link DVI port, and one dual-link DVI port (build-to-order option)
  - NVIDIA Quadro FX 4500 with 512MB of GDDR3 SDRAM, two dual-link DVI ports, and one stereo 3D port (build-to-order option; occupies 16-lane PCI Express slot and adjacent PCI Express slot)
- Support for graphics cards that require up to 150W
- Support for digital resolutions up to 1920 by 1200 pixels; dual-link DVI ports support up to 2560 by 1600 pixels
- Support for analog resolutions up to 2048 by 1536 pixels
- DVI to VGA Adapter included
- Dual-display support for extended desktop and video mirroring modes
- Support for up to two Apple flat-panel displays for each graphics card installed

Storage

- Two 3.5-inch hard drive bays, each with a 150-MBps Serial ATA controller; one of the following is installed:
  - One 160GB 7200-rpm Serial ATA; 8MB memory buffer(1)
  - One 250GB 7200-rpm Serial ATA; 8MB memory buffer (1)
  - One or two 500GB 7200-rpm Serial ATA; 16MB memory buffer (build-to-order option)(1)
- 16x SuperDrive with double-layer support (DVD+R DL/DVD±RW/CD-RW); writes DVD-R discs at up to 16x speed, writes DVD+R DL discs at up to 6x speed, reads DVDs at up to 16x speed, writes CD-R and CD-RW discs at up to 24x speed, reads CDs at up to 32x speed

Communications

- Two independent 10/100/1000BASE-T Ethernet (RJ-45) interfaces with support for jumbo frames
- Optional AirPort Extreme and Bluetooth 2.0 (build-to-order option or installed by Apple Authorized Service Provider)
  - AirPort Extreme: Based on IEEE 802.11g standard and Wi-Fi Certified for 802.11g and 802.11b interoperability (4)
  - Bluetooth: Support for Enhanced Data Rate, or data rates up to 3 Mbps
- Optional external Apple USB Modem (RJ-11) (5)
- Integrated wireless antenna

Peripherals and audio

- One FireWire 800 port and two FireWire 400 ports (one on front panel, 15W total power)
- Four USB 2.0 ports (one on front panel), two USB 1.1 ports on included keyboard
- Front headphone minijack and speaker
- Optical digital audio input and output Toslink connectors
- Stereo analog line level input and line level output minijacks

Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100 - 125V AC or 200 - 240V AC (wide-range power supply input voltage)
- Frequency: 50Hz to 60Hz, single phase
- Maximum current: At least 10A (low-voltage range) or 5A (high-voltage range)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 149° F (-40° to 65° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

Size and weight

- Height: 20.1 inches (51.1 cm)
- Width: 8.1 inches (20.6 cm)
- Depth: 18.7 inches (47.5 cm)
- Weight (standard configurations): 44.5 to 48.8 pounds (20.2 to 22.1 kg) (6)

1. 1GB = 1 billion bytes; actual formatted capacity less.  
2. PCI Express slots are not compatible with PCI or PCI-X expansion cards.  
3. The Apple Wireless Keyboard and Mouse require Bluetooth technology.  
4. Wireless Internet access requires base station or other wireless access point and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.  
5. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.  
6. Weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

# Power Macintosh 8100/110: Technical Specifications

## Power Macintosh 8100/110

Logic Board		Ports		Power		
Processor:	601+, 110	USB:		Max Watts:	200	
PMMU:	integrated	ADB:		Amps:	9	
FPU:	integrated	Video:		BTU per Hr:	684	
Data Path:	64, 36.7	Floppy:		Voltage:	100-240	
L1 Cache:	32K	SCSI:		Freq Range:	50-60 Hz	
L2 Cache:	256K	Geoports:		Battery Type:	3.6V lithium	
2nd Processor:	none	Ethernet:		Soft Power:	yes	
Slots:	3 NuBus, PDS filled	FireWire:		Pass Through:	yes	
		Mic Type:				
		AirPort Ready:				
		Other Ports:				
		Printer				
		Modem				
		Speaker				
		,				
Memory		Video Memory				
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45)  (built in)	Video Memory 2MB VRAM (built in)	Video Memory 4MB VRAM (4x512K)	
RAM Slots:	8, 72-pin SIMM		512 x 384	16-bit	24-bit	24-bit
Min - Max RAM:	16 MB - 264 MB		640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	80		640 x 480	16-bit	24-bit	24-bit
RAM Sizes:	4, 8, 16, 32 MB		800 x 600	n/a-bit	n/a-bit	n/a-bit
Install in Groups of:	2		832 x 624	8-bit	24-bit	24-bit
			1024 x 768	n/a-bit	16-bit	24-bit
			1152 x 870	n/a-bit	16-bit	24-bit
			1280 x 1024	n/a-bit	n/a-bit	n/a-bit
Physical		Software			Storage	
Introduced:	11/3/1994	Addressing Modes:			Floppy Size:	1.44MB
Discontinued:	8/5/1995	Orig SSW:			Floppy Inject:	manual
Form Factor:	Quadra 800	Orig Enabler:			Min. Int HD Size:	2GB
Gestalt ID:	40	ROM ID:			Int HD Interface:	SCSI
Weight (lbs):	25.3	ROM Ver:			Orig CD Speed	2x
Dimensions (in):	14 H x 7.7 W x 15.75 D	ROM Size:			Int CD Support:	yes
		AppleTalk Ver:				
		Mac OS				
		Supported:				
		7.5				
		7.5.1				
		7.5.3				
		7.5.5				
		7.6				
		7.6.1				
		8.0				
		8.5				
		8.1				
		8.6				
		9				

# Macintosh Performa 6410:Technical Specifications

Macintosh Performa 6410

Logic Board	Ports	Power
Processor: 603e, 180	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: opt.	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatbility Card	Ethernet: none	Soft Power: yes
Slots: 2 PCI, Comm II, TV, video in	FireWire:	Pass Through: yes
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution Video Memory 1MB DRAM (built in)	
RAM Slots: 2, 168-pin DIMM	512 x 384 n/a-bit	
Min - Max RAM: 16 MB - 136 MB	640 x 400 n/a-bit	
Min RAM Speed: 70	640 x 480 16-bit	
RAM Sizes: 8, 16, 32, 64 MB	800 x 600 16-bit	
Install in Groups of: 1	832 x 624 8-bit	
	1024 x 768 8-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
Physical	Software	Storage
Introduced: 11/12/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: Performa 6400	Orig Enabler: System Enabler 410 v1.1	Min. Int HD Size: 1.6GB
Gestalt ID: 58	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 44.5	ROM Ver: \$29	Orig CD Speed 8x
Dimensions (in): 16 H x 7.8 W x 16.9 D	ROM Size: 4MB	Int CD Support: yes
Notes: This system is not sold in the U.S.	AppleTalk Ver: 58.1.5	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0	

# Power Macintosh 8115/110: Technical Specifications

## Power Macintosh 8115/110

Logic Board		Ports		Power	
Processor:	601+, 110	USB:		Max Watts:	200
PMMU:	integrated	ADB:	1	Amps:	9
FPU:	integrated	Video:	DB-15, HDI-45	BTU per Hr:	684
Data Path:	64, 36.7	Floppy:	none	Voltage:	100-240
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	AAUI-15	Soft Power:	yes
Slots:	3 NuBus, PDS filled	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	8 MB	Resolution	Video Memory DRAM (HDI-45) (built in)	Video Memory 2MB VRAM (built in)	Video Memory 4MB VRAM (4x512K)
RAM Slots:	8, 72-pin SIMM	512 x 384	16-bit	24-bit	24-bit
Min - Max RAM:	8 MB - 264 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	80	640 x 480	16-bit	24-bit	24-bit
RAM Sizes:	4, 8, 16, 32 MB	800 x 600	n/a-bit	n/a-bit	n/a-bit
Install in Groups of:	2	832 x 624	8-bit	24-bit	24-bit
		1024 x 768	n/a-bit	16-bit	24-bit
		1152 x 870	n/a-bit	16-bit	24-bit
		1280 x 1024	n/a-bit	n/a-bit	n/a-bit
Physical		Software		Storage	
Introduced:	2/23/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	J-7.5	Floppy Inject:	manual
Form Factor:	Quadra 800	Orig Enabler:	PowerPC Enabler v1.1.1	Min. Int HD Size:	2GB
Gestalt ID:	40	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	25.3	ROM Ver:	\$23	Orig CD Speed	2x
Dimensions (in):	14 H x 7.7 W x 15.75 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	58.1.3		
		Mac OS Supported:	7.5 7.5.1 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		

# Macintosh Performa 6420:Technical Specifications

Macintosh Performa 6420

Logic Board	Ports	Power
Processor: 603e, 200	USB:	Max Watts: 220
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 752.4
Data Path: 64, 40	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor: opt. PC Compatbility Card	Ethernet: none	Soft Power: yes
Slots: 2 PCI, Comm II, TV, video in	FireWire:	Pass Through: yes
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
Memory	Video Memory	
Logic Board: 8 MB	Resolution Video Memory 1MB DRAM (built in)	
RAM Slots: 2, 168-pin DIMM	512 x 384 n/a-bit	
Min - Max RAM: 24 MB - 136 MB	640 x 400 n/a-bit	
Min RAM Speed: 70	640 x 480 16-bit	
RAM Sizes: 8, 16, 32, 64MB	800 x 600 16-bit	
Install in Groups of: 1	832 x 624 8-bit	
	1024 x 768 8-bit	
	1152 x 870 n/a-bit	
	1280 x 1024 n/a-bit	
Physical	Software	Storage
Introduced: 11/12/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: Performa 6400	Orig Enabler: System Enabler 410 v1.1	Min. Int HD Size: 2.4GB
Gestalt ID: 58	ROM ID: \$077D	Int HD Interface: IDE
Weight (lbs): 44.5	ROM Ver: \$29	Orig CD Speed 8x
Dimensions (in): 16 H x 7.8 W x 16.9 D	ROM Size: 4MB	Int CD Support: yes
Notes: This system is not sold in the U.S.	AppleTalk Ver: 58.1.5	
	Mac OS Supported: 7.5.3 7.5.5 7.6 8.0 7.6.1	



# Power Macintosh 8200/100: Technical Specifications

## Power Macintosh 8200/100

Logic Board		Ports		Power	
Processor:	601, 100	USB:		Max Watts:	150
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	513
Data Path:	64, 40	Floppy:	none	Voltage:	100-240
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	opt'l.	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatibility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 1MB VRAM (built in)	Video Memory 2MB VRAM (1x1MB)	Video Memory 4MB VRAM (3x1MB)
RAM Slots:	4, 168-pin DIMM	512 x 384	24-bit	24-bit	24-bit
Min - Max RAM:	8 MB - 256 MB	640 x 400	n/a-bit	n/a-bit	n/a-bit
Min RAM Speed:	70	640 x 480	16-bit	24-bit	24-bit
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	16-bit	24-bit	24-bit
Install in Groups of:	1	832 x 624	16-bit	24-bit	24-bit
Notes:	128MB DIMMs can be used, but have not been tested.	1024 x 768	8-bit	16-bit	24-bit
		1152 x 870	8-bit	16-bit	16-bit
		1280 x 1024	n/a-bit	8-bit	16-bit
Physical		Software		Storage	
Introduced:	4/22/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	Quadra 800	Orig Enabler:	none	Min. Int HD Size:	1.2GB
Gestalt ID:	108	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	25	ROM Ver:	\$28	Orig CD Speed	4x
Dimensions (in):	14 H x 7.7 W x 15.75 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	60.1.0		
		Mac OS Supported:	7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		



# Power Macintosh 8500/120: Technical Specifications

## Power Macintosh 8500/120

Logic Board	Ports	Power
Processor: 604, 120	USB:	Max Watts: 225
PMMU: integrated	ADB: 1	Amps: 9
FPU: integrated	Video: DB-15	BTU per Hr: 769.5
Data Path: 64, 40	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Soft Power: yes
Slots: 3 PCI	FireWire:	Pass Through: yes
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer, Modem, Speaker, /	
	Port Notes: Includes S-video and RCA ports for video in and out. Includes RCA ports for sound in and out.	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB VRAM (2x1MB) Video Memory 4MB VRAM (4x1MB)
RAM Slots: 8, 168-pin DIMM	512 x 384	24-bit 24-bit
Min - Max RAM: 16 MB - 512 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 70	640 x 480	24-bit 24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit 24-bit
Install in Groups of: 1	832 x 624	24-bit 24-bit
Notes: 128MB DIMMs can be used, but have not been tested.	1024 x 768	16-bit 24-bit
	1152 x 870	16-bit 24-bit
	1280 x 1024	8-bit 16-bit
	Notes: Video mirroring requires 4MB of VRAM.	
Physical	Software	Storage
Introduced: 8/8/1995	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.2	Floppy Inject: manual
Form Factor: Quadra 800	Orig Enabler: System Enabler 701 v1.2	Min. Int HD Size: 1, 2GB
Gestalt ID: 69	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: \$28	Orig CD Speed: 4x
Dimensions (in): 14 H x 7.7 W x 15.75 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.0.6	
	Mac OS Supported: 7.5.2 7.5.3 7.5.5 7.6.1 8.0 7.6 8.5 8.1 8.6 9	

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Published Date: Jul 26, 2017

# Power Macintosh 8500/132: Technical Specifications

## Power Macintosh 8500/132

Logic Board	Ports	Power																											
Processor: 604, 132 PMMU: integrated FPU: integrated Data Path: 64, 44 L1 Cache: 32K L2 Cache: 256K 2nd Processor: opt. PC Compatibility Card Slots: 3 PCI	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: 2 Ethernet: AAUI, 10baseT FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer, Modem, Speaker, / Port Notes: Includes S-video and RCA ports for video in and out. Includes RCA ports for sound in and out.	Max Watts: 225 Amps: 9 BTU per Hr: 769.5 Voltage: 100-125/200-240 Freq Range: 50-60 Hz Battery Type: 3.6V lithium Soft Power: yes Pass Through: yes																											
Memory	Video Memory																												
Logic Board: none RAM Slots: 8, 168-pin DIMM Min - Max RAM: 16 MB - 512 MB Min RAM Speed: 70 RAM Sizes: 8, 16, 32, 64 MB Install in Groups of: 1 Notes: 128MB DIMMs can be used, but have not been tested.	<table> <thead> <tr> <th>Resolution</th><th>Video Memory 2MB VRAM (2x1MB)</th><th>Video Memory 4MB VRAM (4x1MB)</th></tr> </thead> <tbody> <tr><td>512 x 384</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>640 x 400</td><td>n/a-bit</td><td>n/a-bit</td></tr> <tr><td>640 x 480</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>800 x 600</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>832 x 624</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>1024 x 768</td><td>16-bit</td><td>24-bit</td></tr> <tr><td>1152 x 870</td><td>16-bit</td><td>24-bit</td></tr> <tr><td>1280 x 1024</td><td>8-bit</td><td>16-bit</td></tr> </tbody> </table> Notes: Video mirroring requires 4MB of VRAM.	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	512 x 384	24-bit	24-bit	640 x 400	n/a-bit	n/a-bit	640 x 480	24-bit	24-bit	800 x 600	24-bit	24-bit	832 x 624	24-bit	24-bit	1024 x 768	16-bit	24-bit	1152 x 870	16-bit	24-bit	1280 x 1024	8-bit	16-bit	
Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)																											
512 x 384	24-bit	24-bit																											
640 x 400	n/a-bit	n/a-bit																											
640 x 480	24-bit	24-bit																											
800 x 600	24-bit	24-bit																											
832 x 624	24-bit	24-bit																											
1024 x 768	16-bit	24-bit																											
1152 x 870	16-bit	24-bit																											
1280 x 1024	8-bit	16-bit																											
Physical	Software	Storage																											
Introduced: 4/22/1996 Discontinued: n/a Form Factor: Quadra 800 Gestalt ID: 69 Weight (lbs): 25 Dimensions (in): 14 H x 7.7 W x 15.75 D	Addressing Modes: 32-bit Orig SSW: 7.5.3 Orig Enabler: none ROM ID: \$077D ROM Ver: \$28 ROM Size: 4MB AppleTalk Ver: 60.1.0 Mac OS Supported: 7.5.3, 7.5.5, 7.6, 7.6.1, 8.0, 8.5, 8.1, 8.6, 9	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1.2GB Int HD Interface: SCSI Orig CD Speed: 4x Int CD Support: yes																											

# Power Macintosh 8500/150: Technical Specifications

## Power Macintosh 8500/150

Logic Board	Ports	Power																											
Processor: 604, 150 PMMU: integrated FPU: integrated Data Path: 64, 50 L1 Cache: 32K L2 Cache: 256K 2nd Processor: opt. PC Compatibility Card Slots: 3 PCI	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: 2 Ethernet: AAUI, 10baseT FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer, Modem, Speaker, / Port Notes: Includes S-video and RCA ports for video in and out. Includes RCA ports for sound in and out.	Max Watts: 225 Amps: 9 BTU per Hr: 769.5 Voltage: 100-125/200-240 Freq Range: 50-60 Hz Battery Type: 3.6V lithium Soft Power: yes Pass Through: yes																											
Memory	Video Memory																												
Logic Board: none RAM Slots: 8, 168-pin DIMM Min - Max RAM: 16 MB - 512 MB Min RAM Speed: 70 RAM Sizes: 8, 16, 32, 64 MB Install in Groups of: 1 Notes: 128MB DIMMs can be used, but have not been tested.	<table> <thead> <tr> <th>Resolution</th><th>Video Memory 2MB VRAM (2x1MB)</th><th>Video Memory 4MB VRAM (4x1MB)</th></tr> </thead> <tbody> <tr><td>512 x 384</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>640 x 400</td><td>n/a-bit</td><td>n/a-bit</td></tr> <tr><td>640 x 480</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>800 x 600</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>832 x 624</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>1024 x 768</td><td>16-bit</td><td>24-bit</td></tr> <tr><td>1152 x 870</td><td>16-bit</td><td>24-bit</td></tr> <tr><td>1280 x 1024</td><td>8-bit</td><td>16-bit</td></tr> </tbody> </table> Notes: Video mirroring requires 4MB of VRAM.	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	512 x 384	24-bit	24-bit	640 x 400	n/a-bit	n/a-bit	640 x 480	24-bit	24-bit	800 x 600	24-bit	24-bit	832 x 624	24-bit	24-bit	1024 x 768	16-bit	24-bit	1152 x 870	16-bit	24-bit	1280 x 1024	8-bit	16-bit	
Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)																											
512 x 384	24-bit	24-bit																											
640 x 400	n/a-bit	n/a-bit																											
640 x 480	24-bit	24-bit																											
800 x 600	24-bit	24-bit																											
832 x 624	24-bit	24-bit																											
1024 x 768	16-bit	24-bit																											
1152 x 870	16-bit	24-bit																											
1280 x 1024	8-bit	16-bit																											
Physical	Software	Storage																											
Introduced: 4/22/1996 Discontinued: n/a Form Factor: Quadra 800 Gestalt ID: 69 Weight (lbs): 25 Dimensions (in): 14 H x 7.7 W x 15.75 D	Addressing Modes: 32-bit Orig SSW: 7.5.3 Orig Enabler: none ROM ID: \$077D ROM Ver: \$28 ROM Size: 4MB AppleTalk Ver: 60.1.0 Mac OS Supported: 7.5.3, 7.5.5, 7.6, 7.6.1, 8.0, 8.5, 8.1, 8.6, 9	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 2GB Int HD Interface: SCSI Orig CD Speed: 4x, 8x Int CD Support: yes																											

# Power Macintosh 8500/180: Technical Specifications

## Power Macintosh 8500/180

Logic Board	Ports	Power
Processor: 604e, 180	USB:	Max Watts: 225
PMMU: integrated	ADB: 1	Amps: 9
FPU: integrated	Video: DB-15	BTU per Hr: 769.5
Data Path: 64, 45	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 64K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Soft Power: yes
Slots: 3 PCI	FireWire:	Pass Through: yes
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer, Modem, Speaker, /	
	Port Notes: Includes S-video and RCA ports for video in and out. Includes RCA ports for sound in and out.	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB VRAM (2x1MB) Video Memory 4MB VRAM (4x1MB)
RAM Slots: 8, 168-pin DIMM	512 x 384	24-bit 24-bit
Min - Max RAM: 16 MB - 512 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 70	640 x 480	24-bit 24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit 24-bit
Install in Groups of: 1	832 x 624	24-bit 24-bit
Notes: 128MB DIMMs can be used, but have not been tested.	1024 x 768	16-bit 24-bit
	1152 x 870	16-bit 24-bit
	1280 x 1024	8-bit 16-bit
	Notes: Video mirroring requires 4MB of VRAM.	
Physical	Software	Storage
Introduced: 8/5/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.3	Floppy Inject: manual
Form Factor: Quadra 800	Orig Enabler: none	Min. Int HD Size: 2GB
Gestalt ID: 69	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: \$28	Orig CD Speed: 8x
Dimensions (in): 14 H x 7.7 W x 15.75 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.0	
	Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	

# PowerBook G4 (12-inch, 15-inch, 17-inch Double-Layer SD) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (12-inch, 15-inch, 17-inch Double-Layer SD) - Technical Specifications

Configurations	12-inch PowerBook	15-inch PowerBook	17-inch PowerBook
Model	M9691LL/A	M9969LL/A	M9970LL/A
Processor	1.5GHz PowerPC G4	1.67GHz PowerPC G4	
Memory	512MB PC2700 DDR SDRAM (running at 333MHz)	512MB PC2-4200 DDR2 SDRAM (running at 333MHz)	
Display	12.1-inch (diagonal), 1024 x 768 resolution, TFT	15.2-inch (diagonal), 1440 x 960 resolution, TFT widescreen	17-inch (diagonal), 1680 x 1050 resolution, TFT widescreen
Graphics	NVIDIA GeForce FX Go5200 with 64MB of DDR SDRAM	ATI Mobility Radeon 9700 with 128MB of DDR SDRAM and dual-link DVI	
Video out	Mini-DVI, VGA, S-video and composite (adapter sold separately)	DVI, VGA, S-video and composite	
Audio	Audio line-in, headphone-out, stereo speakers, microphone	Combined analog and optical digital line-in, combined analog and optical digital line-out, stereo speakers, microphone	
Hard disk drive <sup>(1)</sup>	80GB Ultra ATA/100; 5400 rpm		120GB Ultra ATA/100; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±RW/CD-RW)	8x SuperDrive (DVD+R DL/DVD±RW/CD-RW)	
Ethernet	Built-in 10/100BASE-T	Built-in 10/100/1000BASE-T (Gigabit)	
Wireless <sup>(2)</sup>	Built-in 54-Mbps AirPort Extreme (Wi-Fi 802.11g); built-in Bluetooth 2.0+EDR		
Modem <sup>(3)</sup>	Built-in 56K V.92 modem		
Keyboard	Full size	Full size, illuminated with ambient light sensor	
Expansion	One FireWire 400 and two USB 2.0 ports	One FireWire 400, one FireWire 800, two USB 2.0 ports, and Type I/II PC Card slot	
Weight	4.6 pounds	5.6 pounds	6.9 pounds
Footprint	10.9 x 8.6 inches	13.7 x 9.5 inches	15.4 x 10.2 inches
Thickness	1.18 inches	1.1 inches	1 inch
Battery life	Up to 5 hours	Up to 5.5 hours	
System software	Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Classic environment, Xcode Developer Tools)		
Software	iLife '05 (includes iTunes, iPhoto, iMovie HD, iDVD, GarageBand), Microsoft Office 2004 for Mac Test Drive, Zinio Reader, Art Directors Toolkit, FileMaker Pro Trial, GraphicConverter, OmniGraffle, OmniOutliner, QuickBooks For Mac New User Edition, and Apple Hardware Test		
Video accessories	Mini-DVI to DVI adapter, mini-DVI to VGA adapter	S-video to composite adapter, DVI to VGA adapter	
Hardware accessories	Modem cable, power adapter, AC wall plug, power cord, lithium-ion battery		
Limited warranty and service	Your PowerBook G4 comes with 90 days of telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> and get three years of service and support. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.		
Build-to-Order Options	Order a custom-configured PowerBook G4 from the online <a href="#">Apple Store</a> or an authorized Apple reseller.		
Memory	512MB, 1GB SO-DIMMs; upgradable to 1.25GB on 12-inch model and to 2GB on 15- and 17-inch models		
Hard drive	100GB 7200-rpm drive option available on 15- and 17-inch models; 120GB 5400-rpm drive option available on 15-inch model; 100GB 5400-rpm drive option available on 12-inch and 15-inch models; (only from the online Apple Store)		
Optical drive	Combo drive		
Wireless	AirPort Extreme Base Station (with modem and antenna port) M8799LL/A AirPort Express Base Station M9470LL/A		
Battery and power	Apple Portable Power Adapter M8943LL/A PowerBook G4 12-inch Rechargeable Battery M9572G/A PowerBook G4 15-inch Rechargeable Battery M9756G/A PowerBook G4 17-inch Rechargeable Battery M9326G/A		



External keyboard and mouse	Apple Wireless Keyboard M9270LL/A
	Apple Wireless Mouse M9269Z/A
	Apple Keyboard (White) M9034LL/A
	Apple Mighty Mouse MA086LL/A
Services	AppleCare Protection Plan M8853LL/A .Mac Subscription MA175Z/A

Technical Specifications

Processor and Memory

- 1.67GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus
- 512MB (single SO-DIMM) of PC2-4200 DDR2 SDRAM running at 333MHz; two SO-DIMM slots; support for up to 2GB

Storage <sup>(1)</sup>

- 120GB 5400-rpm or optional 100GB 7200-rpm Ultra ATA/100 hard drive with Sudden Motion Sensor
- Slot-loading SuperDrive (DVD+R DL/DVD±RW/CD-RW)
  - Maximum write: 8x DVD-R and DVD+R; 4x DVD-RW and DVD+RW; 2.4 DVD+R (double layer), 24x CD-R; 16x CD-RW
  - Maximum read: 8x DVD-ROM (single layer); 6x DVD-ROM (double layer), DVD-R, DVD-RW, DVD+R and DVD+RW; 24x CD-R
- Optional slot-loading Combo drive (DVD-ROM/CD-RW)
  - Maximum write: 24x CD-R; 16x CD-RW
  - Maximum read: 8x DVD; 24x CD

Communications

- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) <sup>(3)</sup>
- Built-in [Bluetooth 2.0+EDR](#) (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T (Gigabit) Ethernet (RJ-45 connector)
- Built-in 56K V.92 modem (RJ-11 connector) <sup>(4)</sup>

Expansion

- One FireWire 800 port at up to 800 Mbps; one FireWire 400 (IEEE 1394a) port at up to 400 Mbps <sup>(5)</sup>
- Two USB 2.0 ports at up to 480 Mbps
- Type I/II PC Card slot

Display

- 17-inch (diagonal) TFT display
  - Support for millions of colors at 1680 x 1050 pixel resolution
  - Support for resolutions of 1680 x 1050 (native), 1440 x 852, 1280 x 1024, 1280 x 800, 1152 x 720, 1024 x 768, 1024 x 640, 800 x 500, 720 x 480 and 640 x 480 at 16:10 aspect ratio; 1280 x 1024, 1024 x 768, 800 x 600 and 640 x 480 at 4:3 aspect ratio; 720 x 480 at 3:2 aspect ratio

Video and graphics support

- ATI Mobility Radeon 9700 graphics processor with AGP 4X support and 128MB of DDR SDRAM video memory
  - Dual-link DVI functionality
  - Dual display and video mirroring: Simultaneously supports up to 1680 x 1050 pixels on the built-in display and up to 2560 x 1600 pixels on an external display, both at millions of colors <sup>(6)</sup>
- DVI output port
- VGA output port using included DVI to VGA adapter
- S-video output port
- Composite video output using included S-video to composite adapter

Audio

- Combined optical digital input/audio line in (minijack)
- Combined optical digital output/headphone out (minijack)
- Two built-in stereo speakers
- Internal omnidirectional microphone

Security

- Kensington cable lock slot

Battery and power

- 58-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 5.5 hours of battery life <sup>(7)</sup>
- 65W power adapter with cable management system
- Power adapter port

Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted

# 38\_PowerBook G4 (12-inch, 15-inch, 17-inch Double-Layer SD) - Technical Specifications.pdf

- “T” arrangement) and embedded keypad
- Illuminated fiber-optic, backlit keyboard with ambient light sensor
- Solid-state trackpad provides precise cursor control; supports tap, double-tap, drag and scrolling capabilities

**Electrical and environmental requirements**

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 ft
- Maximum storage altitude: 15,000 ft
- Maximum shipping altitude: 35,000 ft

**Size and weight**

- Height: 1.0 inch (2.6 cm)
- Width: 15.4 inches (39.2 cm)
- Depth: 10.2 inches (25.9 cm)
- Weight: 6.9 pounds (3.1 kg) with battery and optical drive installed <sup>(8)</sup>

- 1GB = 1 billion bytes; actual formatted capacity less.
- Wireless Internet access requires base station or other wireless access point and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.
- Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.
- Burning DVDs in iDVD requires an Apple SuperDrive, but iDVD projects can be saved as an archive on a Combo drive and later transferred to a SuperDrive-equipped system and burned to a DVD.
- Actual rates will vary.
- Some third-party DVI displays may not support all resolutions. Actual resolutions and refresh rates depend on the monitor.
- Battery life depends on configuration and use.
- Actual weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

# Power Macintosh 8515/120: Technical Specifications

## Power Macintosh 8515/120

Logic Board	Ports	Power
Processor: 604, 120	USB:	Max Watts: 225
PMMU: integrated	ADB: 1	Amps: 9
FPU: integrated	Video: DB-15	BTU per Hr: 769.5
Data Path: 64, 40	Floppy: none	Voltage: 100-240
L1 Cache: 32K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 256K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Soft Power: yes
Slots: 3 PCI	FireWire:	Pass Through: yes
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer, Modem, Speaker, ,	
	Port Notes: Includes S-video and RCA ports for video in and out. Includes RCA ports for sound in and out.	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory 2MB VRAM (2x1MB) Video Memory 4MB VRAM (4x1MB)
RAM Slots: 8, 168-pin DIMM	512 x 384	24-bit 24-bit
Min - Max RAM: 32 MB - 512 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 70	640 x 480	24-bit 24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit 24-bit
Install in Groups of: 1	832 x 624	24-bit 24-bit
Notes: 128MB DIMMs can be used, but have not been tested.	1024 x 768	16-bit 24-bit
	1152 x 870	16-bit 24-bit
	1280 x 1024	8-bit 16-bit
	Notes: Video mirroring requires 4MB of VRAM.	
Physical	Software	Storage
Introduced: 1/11/1996	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: J-7.5.2	Floppy Inject: manual
Form Factor: Quadra 800	Orig Enabler: System Enabler 701 v1.2	Min. Int HD Size: 2GB
Gestalt ID: 69	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 25	ROM Ver: \$28	Orig CD Speed: 4x
Dimensions (in): 14 H x 7.7 W x 15.75 D	ROM Size: 4MB	Int CD Support: yes
Notes: This system is not sold in the U.S.	AppleTalk Ver: 60.0.6	
	Mac OS Supported: 7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9	

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Published Date: Jul 26, 2017

# Power Macintosh 8600/200: Technical Specifications

## Power Macintosh 8600/200

Logic Board		Ports		Power	
Processor:	604e, 200	USB:		Max Watts:	390
PMMU:	integrated	ADB:	1	Amps:	3
FPU:	integrated	Video:	DB-15	BTU per Hr:	1333.8
Data Path:	64, 50	Floppy:	none	Voltage:	100-240
L1 Cache:	64K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	256K	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatibility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	3 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
		Port Notes:	Includes S-video and RCA ports for video in and out. Includes RCA ports for sound in and out.		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	
RAM Slots:	8, 168-pin DIMM	512 x 384	24-bit	24-bit	
Min - Max RAM:	32 MB - 512 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
		Notes: Video mirroring requires 4MB of VRAM.			
Physical		Software		Storage	
Introduced:	2/17/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.5	Floppy Inject:	manual
Form Factor:	PM 9600	Orig Enabler:	System Enabler 702	Min. Int HD Size:	2GB
Gestalt ID:	69	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	35	ROM Ver:	\$34	Orig CD Speed	12x
Dimensions (in):	17.3 H x 9.7 W x 17.3 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.1	Notes:	Systems ship with an Iomega Zip drive.
		Mac OS Supported:	7.5.5 7.6.1 8.0 8.5 8.1 8.6 9		

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Published Date: Jul 26, 2017

# Power Macintosh 8600/250: Technical Specifications

## Power Macintosh 8600/250

Logic Board	Ports	Power																											
Processor: 604e, 250 PMMU: integrated FPU: integrated Data Path: 64, 100 L1 Cache: 64K L2 Cache: 1MB 2nd Processor: opt. PC Compatibility Card Slots: 3 PCI Notes: System supports 100 MHz cache bus, and 50 MHz system bus speeds.	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: 2 Ethernet: AAUI, 10baseT FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker Port Notes: Includes S-video and RCA ports for video in and out. Includes RCA ports for sound in and out.	Max Watts: 560 Amps: 3 BTU per Hr: 1915.2 Voltage: 100-125/200-240 Freq Range: 50-60 Hz Battery Type: 3.6V lithium Soft Power: yes Pass Through: yes																											
Memory	Video Memory																												
Logic Board: none RAM Slots: 8, 168-pin DIMM Min - Max RAM: 32 MB - 512 MB Min RAM Speed: 70 RAM Sizes: 8, 16, 32, 64MB Install in Groups of: 1 Notes: 128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	<table> <thead> <tr> <th>Resolution</th><th>Video Memory 2MB VRAM (2x1MB)</th><th>Video Memory 4MB VRAM (4x1MB)</th></tr> </thead> <tbody> <tr><td>512 x 384</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>640 x 400</td><td>n/a-bit</td><td>n/a-bit</td></tr> <tr><td>640 x 480</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>800 x 600</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>832 x 624</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>1024 x 768</td><td>16-bit</td><td>24-bit</td></tr> <tr><td>1152 x 870</td><td>16-bit</td><td>24-bit</td></tr> <tr><td>1280 x 1024</td><td>8-bit</td><td>16-bit</td></tr> </tbody> </table> Notes: Video mirroring requires 4MB of VRAM.	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	512 x 384	24-bit	24-bit	640 x 400	n/a-bit	n/a-bit	640 x 480	24-bit	24-bit	800 x 600	24-bit	24-bit	832 x 624	24-bit	24-bit	1024 x 768	16-bit	24-bit	1152 x 870	16-bit	24-bit	1280 x 1024	8-bit	16-bit	
Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)																											
512 x 384	24-bit	24-bit																											
640 x 400	n/a-bit	n/a-bit																											
640 x 480	24-bit	24-bit																											
800 x 600	24-bit	24-bit																											
832 x 624	24-bit	24-bit																											
1024 x 768	16-bit	24-bit																											
1152 x 870	16-bit	24-bit																											
1280 x 1024	8-bit	16-bit																											
Physical	Software	Storage																											
Introduced: 8/5/1997 Discontinued: n/a Form Factor: PM 9600 Gestalt ID: 103 Weight (lbs): 35 Dimensions (in): 17.3 H x 9.7 W x 17.3 D	Addressing Modes: 32-bit Orig SSW: 7.6.1 Orig Enabler: none ROM ID: \$077D ROM Ver: n/a ROM Size: 4MB AppleTalk Ver: 60.1.1 Mac OS Supported: 7.6.1 8.0 8.1 8.5 8.6 9	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 4GB Int HD Interface: SCSI Orig CD Speed: 24x Int CD Support: yes Notes: System ships with an Iomega Zip drive.																											

# Power Macintosh 8600/300: Technical Specifications

## Power Macintosh 8600/300

Logic Board	Ports	Power																											
Processor: 604e, 300 PMMU: integrated FPU: integrated Data Path: 64, 100 L1 Cache: 64K L2 Cache: 1MB 2nd Processor: opt. PC Compatibility Card Slots: 3 PCI Notes: System supports 100 MHz cache bus, and 50 MHz system bus speeds.	USB: ADB: 1 Video: DB-15 Floppy: none SCSI: DB-25 Geoports: 2 Ethernet: AAUI, 10baseT FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker Port Notes: Includes S-video and RCA ports for video in and out. Includes RCA ports for sound in and out.	Max Watts: 560 Amps: 3 BTU per Hr: 1915.2 Voltage: 100-125/200-240 Freq Range: 50-60 Hz Battery Type: 3.6V lithium Soft Power: yes Pass Through: yes																											
Memory	Video Memory																												
Logic Board: none RAM Slots: 8, 168-pin DIMM Min - Max RAM: 32 MB - 512 MB Min RAM Speed: 70 RAM Sizes: 8, 16, 32, 64MB Install in Groups of: 1 Notes: 128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	<table> <thead> <tr> <th>Resolution</th><th>Video Memory 2MB VRAM (2x1MB)</th><th>Video Memory 4MB VRAM (4x1MB)</th></tr> </thead> <tbody> <tr><td>512 x 384</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>640 x 400</td><td>n/a-bit</td><td>n/a-bit</td></tr> <tr><td>640 x 480</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>800 x 600</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>832 x 624</td><td>24-bit</td><td>24-bit</td></tr> <tr><td>1024 x 768</td><td>16-bit</td><td>24-bit</td></tr> <tr><td>1152 x 870</td><td>16-bit</td><td>24-bit</td></tr> <tr><td>1280 x 1024</td><td>8-bit</td><td>16-bit</td></tr> </tbody> </table> Notes: Video mirroring requires 4MB of VRAM.	Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)	512 x 384	24-bit	24-bit	640 x 400	n/a-bit	n/a-bit	640 x 480	24-bit	24-bit	800 x 600	24-bit	24-bit	832 x 624	24-bit	24-bit	1024 x 768	16-bit	24-bit	1152 x 870	16-bit	24-bit	1280 x 1024	8-bit	16-bit	
Resolution	Video Memory 2MB VRAM (2x1MB)	Video Memory 4MB VRAM (4x1MB)																											
512 x 384	24-bit	24-bit																											
640 x 400	n/a-bit	n/a-bit																											
640 x 480	24-bit	24-bit																											
800 x 600	24-bit	24-bit																											
832 x 624	24-bit	24-bit																											
1024 x 768	16-bit	24-bit																											
1152 x 870	16-bit	24-bit																											
1280 x 1024	8-bit	16-bit																											
Physical	Software	Storage																											
Introduced: 8/5/1997 Discontinued: n/a Form Factor: PM 9600 Gestalt ID: 103 Weight (lbs): 35 Dimensions (in): 17.3 H x 9.7 W x 17.3 D	Addressing Modes: 32-bit Orig SSW: 7.6.1 Orig Enabler: none ROM ID: \$077D ROM Ver: n/a ROM Size: 4MB AppleTalk Ver: 60.1.1 Mac OS Supported: 7.6.1, 8.0, 8.1, 8.5, 8.6, 9	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 4GB Int HD Interface: SCSI Orig CD Speed: 24x Int CD Support: yes Notes: System ships with an Iomega Zip drive.																											



# Power Macintosh 9500/120: Technical Specifications

## Power Macintosh 9500/120

Logic Board		Ports		Power	
Processor:	604, 120	USB:		Max Watts:	225
PMMU:	integrated	ADB: 1		Amps:	9
FPU:	integrated	Video: none		BTU per Hr:	769.5
Data Path:	64, 40	Floppy: none		Voltage:	100-
L1 Cache:	32K	SCSI: DB-25			125/200-240
L2 Cache:	512K	Geoports: 2		Freq Range:	50-60 Hz
2nd Processor:	opt. PC Compatibility Card	Ethernet: AAUI, 10baseT		Battery Type:	3.6V lithium
Slots:	6 PCI	FireWire:		Soft Power:	yes
Notes:	One PCI slot occupied by video card.	Mic Type: PlainTalk		Pass Through:	yes
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory video card (2MB on-card)	Video Memory video card (4MB) (module)	
RAM Slots:	12, 168-pin DIMM	512 x 384	n/a-bit	n/a-bit	
Min - Max RAM:	16 MB - 768 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
		Notes: A video card ships bundled with this system.			
Physical		Software		Storage	

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Introduced:	5/1/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	5/18/1996	Orig SSW:	7.5.2	Floppy Inject:	manual
Form Factor:	PM 9500	Orig Enabler:	System Enabler 701 v1.0	Min. Int HD Size:	1GB
Gestalt ID:	67	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	28	ROM Ver:	\$28	Orig CD Speed	4x
Dimensions (in):	16.9 H x 7.7 W x 15.75 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.0.0		
		Mac OS Supported:	7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		
		Notes:	Maximum memory supported by System 7.5.2 is 1GB.		

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# Power Macintosh 9500/132: Technical Specifications

## Power Macintosh 9500/132

Logic Board		Ports		Power					
Processor:	604, 132	USB:		Max Watts:	225				
PMMU:	integrated	ADB: 1		Amps:	9				
FPU:	integrated	Video: none		BTU per Hr:	769.5				
Data Path:	64, 44	Floppy: none		Voltage:	100-125/200-240				
L1 Cache:	32K	SCSI: DB-25							
L2 Cache:	512K	Geoports: 2		Freq Range:	50-60 Hz				
2nd Processor:	opt. PC Compatbility Card	Ethernet: AAUI, 10baseT		Battery Type:	3.6V lithium				
Slots:	6 PCI	FireWire:		Soft Power:	yes				
		Mic Type: PlainTalk		Pass Through:	yes				
		AirPort Ready:							
		Other Ports: Printer Modem Speaker ,							
Memory		Video Memory							
Logic Board:	none	ResolutionVideo Memory requires video card (n/a)  512 x 384n/a-bit 640 x 400n/a-bit 640 x 480n/a-bit 800 x 600n/a-bit 832 x 624n/a-bit 1024 x 768n/a-bit 1152 x 870n/a-bit 1280 x 1024n/a-bit							
RAM Slots:	12, 168-pin DIMM								
Min - Max RAM:	16 MB - 768 MB								
Min RAM Speed:	70								
RAM Sizes:	8, 16, 32, 64 MB								
Install in Groups of:	1								
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.								
Physical						Software		Storage	
Introduced:	5/1/1995					Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	7/13/1996	Orig SSW:	7.5.2	Floppy Inject:	manual				
Form Factor:	PM 9500	Orig Enabler:	System Enabler 701 v1.0	Min. Int HD Size:	2GB				
Gestalt ID:	67	ROM ID:	\$077D	Int HD Interface:	SCSI				
Weight (lbs):	28	ROM Ver:	\$28	Orig CD Speed	4x				
Dimensions (in):	16.9 H x 7.7 W x 15.75 D	ROM Size:	4MB	Int CD Support:	yes				
		AppleTalk Ver:	60.0.0						
		Mac OS Supported:	7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9						
		Notes:	Maximum memory supported by System 7.5.2 is 1GB.						



# Power Macintosh 9600/200: Technical Specifications

## Power Macintosh 9600/200

Logic Board	Ports	Power
Processor: 604e, 200	USB:	Max Watts: 390
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 1333.8
Data Path: 64, 50	Floppy: none	Voltage: 100-240
L1 Cache: 64K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 512K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Soft Power: yes
Slots: 6 PCI	FireWire:	Pass Through: yes
Notes: One PCI slot occupied by video card.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory video card (4MB) (n/a)
RAM Slots: 12, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 32 MB - 768 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
Notes: 128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	24-bit
	1152 x 870	24-bit
	1280 x 1024	24-bit
	Notes: A video card ships bundled with this system. The bundled video card is capable of resolutions up to 1600x1200.	
Physical	Software	Storage
Introduced: 2/17/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.5	Floppy Inject: manual
Form Factor: PM 9600	Orig Enabler: System Enabler 702	Min. Int HD Size: 4GB
Gestalt ID: 67	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 35	ROM Ver: \$34	Orig CD Speed: 12x
Dimensions (in): 17.3 H x 9.7 W x 17.3 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.5.5 7.6.1 8.0 8.5 8.1 8.6 9	

# Apple Multiple Scan 14 Display: Technical Specifications

## Apple Multiple Scan 14 Display

Physical			Power		
Introduced:	8/15/1995		Max Watts: 80		
Discontinued:	n/a		Amps: 1		
Tube Size:	14"		BTU per Hr: 273.6		
Viewable Size:	12.4" VIS		Voltage: 90-132/198-264		
Tube Type:	Shadow Mask		Freq Range: 47-63 Hz		
Weight (lbs):	25				
Dimensions (in): 14.9 H x 14.4 W x 15.2 D					
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	60 Hz	31.5 kHz	65
	Macintosh	640x480	66.7 Hz	35.0 kHz	65
	SVGA	800x600	60 Hz	37.9 kHz	81
	SVGA	800x600	72 Hz	48.1 kHz	81

# Power Macintosh 9600/200MP: Technical Specifications

## Power Macintosh 9600/200MP

Logic Board	Ports	Power
Processor: two 604e, 200	USB:	Max Watts: 390
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 1333.8
Data Path: 64, 50	Floppy: none	Voltage: 100-240
L1 Cache: 64K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 512K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Soft Power: yes
Slots: 6 PCI	FireWire:	Pass Through: yes
Notes: Processor board contains two PowerPC 604e processors. One PCI slot occupied by video card.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory video card (4MB) (n/a)
RAM Slots: 12, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 32 MB - 768 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
Notes: 128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	24-bit
	1152 x 870	24-bit
	1280 x 1024	24-bit
	Notes: A video card ships bundled with this system. The bundled video card is capable of resolutions up to 1600x1200.	
Physical	Software	Storage
Introduced: 2/17/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.5	Floppy Inject: manual
Form Factor: PM 9600	Orig Enabler: System Enabler 702	Min. Int HD Size: 4GB
Gestalt ID: 67	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 35	ROM Ver: \$34	Orig CD Speed: 12x
Dimensions (in): 17.3 H x 9.7 W x 17.3 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.5.5 7.6.1 8.0 8.1 8.5 8.6 9	

# Power Macintosh 9600/233: Technical Specifications

## Power Macintosh 9600/233

Logic Board	Ports	Power
Processor: 604e, 233	USB:	Max Watts: 390
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 1333.8
Data Path: 64, 50	Floppy: none	Voltage: 100-240
L1 Cache: 64K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 512K	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Soft Power: yes
Slots: 6 PCI	FireWire:	Pass Through: yes
Notes: One PCI slot occupied by video card.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory video card (4MB) (n/a)
RAM Slots: 12, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 32 MB - 768 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
Notes: 128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	24-bit
	1152 x 870	24-bit
	1280 x 1024	24-bit
	Notes: A video card ships bundled with this system. The bundled video card is capable of resolutions up to 1600x1200.	
Physical	Software	Storage
Introduced: 2/17/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.5.5	Floppy Inject: manual
Form Factor: PM 9600	Orig Enabler: System Enabler 702	Min. Int HD Size: 4GB
Gestalt ID: 67	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 35	ROM Ver: \$34	Orig CD Speed: 12x
Dimensions (in): 17.3 H x 9.7 W x 17.3 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	
	Mac OS Supported: 7.5.5 8.0 7.6.1 8.1 8.5 8.6 9	



# iPod touch - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

- Height: 4.3 inches (110 mm)
- Width: 2.4 inches (61.8 mm)
- Depth: 0.31 inch (8 mm)
- Weight: 4.2 ounces (120 grams)

## In the box

- iPod touch
- Earphones
- USB 2.0 cable
- Dock adapter
- Polishing cloth
- Stand
- Quick Start guide

## Capacity

- 8GB, 16GB, or 32GB flash drive<sup>1</sup>
- Holds up to 1,750, 3,500, or 7,000 songs in 128-Kbps AAC format<sup>2</sup>
- Holds up to 10,000, 20,000, or 25,000 iPod-viewable photos<sup>3</sup>
- Holds up to 10 hours, 20 hours, or 40 hours of video<sup>4</sup>

## Display

- 3.5-inch (diagonal) widescreen Multi-Touch display
- 480-by-320-pixel resolution at 163 pixels per inch

## Audio

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, AIFF, and WAV

## Video

- H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

## Wireless<sup>5</sup>

- Wi-Fi (802.11b/g)
- Maps location based service<sup>6</sup>

## Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.10 or later
- iTunes 7.6 or later<sup>7</sup>

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## Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 2 or later
- iTunes 7.6 or later<sup>7</sup>

## Languages

- English, French, German, Japanese, Dutch, Italian, Spanish, Portuguese, Danish, Finnish, Norwegian, Swedish, Korean, Simplified Chinese, Traditional Chinese, Russian, and Polish
- International keyboard support for English, UK English, French, French Canadian, German, Japanese, Dutch, Italian, Spanish, Danish, Finnish, Norwegian, Swedish, Polish, and Portuguese
- Dictionary support for English, UK English, French, French Canadian, German, Spanish, Italian, Japanese, and Dutch

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)










## Input and output

- Dock connector
- 3.5-mm stereo headphone jack

## Power and battery<sup>8</sup>

- Built-in rechargeable lithium ion battery
- Playback time
  - Music playback time: Up to 22 hours when fully charged
  - Video playback time: Up to 5 hours when fully charged
- Charging via USB to computer system or power adapter (sold separately)
  - Fast-charge time: about 1.5 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 3 hours
- Design for the Environment

## Comparison Chart

	iPod shuffle		iPod nano		iPod classic		iPod touch		
Storage/capacity	1GB (240 songs)	2GB (500 songs)	4GB (1,000 songs)	8GB (2,000 songs)	80GB (20,000 songs)	160GB (40,000 songs)	8GB (1,750 songs)	16GB (3,500 songs)	32GB (7,000 songs)
Color									
Battery life	Up to 12 hours of music playback		Up to 24 hours of music playback; up to 5 hours of video playback		Up to 30 hours of music playback; up to 5 hours of video playback	Up to 40 hours of music playback; up to 7 hours of video playback	Up to 22 hours of music playback; up to 5 hours of video playback		
Display			2-inch (diagonal) color LCD with LED backlight		2.5-inch (diagonal) color LCD with LED backlight		3.5-inch (diagonal) widescreen Multi-Touch display		
Ports	Stereo minijack		Dock connector, stereo minijack		Dock connector, stereo minijack		Dock connector, stereo minijack		
Connectivity	USB through included dock		USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack		USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack		USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack		
Wireless data							Wi-Fi (802.11b/g)		

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	iPod shuffle	iPod nano	iPod classic		iPod touch
Charge time	About 4 hours (2-hour fast charge to 80% capacity)	About 3 hours (1.5-hour fast charge to 80% capacity)	About 4 hours (2-hour fast charge to 80% capacity)		About 3 hours (1.5-hour fast charge to 80% capacity)
Audio support	AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), WAV, and AIFF	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF		AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF
Photo support		Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats		Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats
Video support		H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats	H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats		H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
Size	1.62 x 1.07 x 0.41 inches (41.2 x 27.3 x 10.5 mm including clip)	2.75 x 2.06 x 0.26 inches (69.8 x 52.3 x 6.5 mm)	4.1 x 2.4 x 0.41 inches (103.5 x 61.8 x 10.5 mm)	4.1 x 2.4 x 0.53 inches (103.5 x 61.8 x 13.5 mm)	4.3 x 2.4 x 0.31 inches (110 x 61.8 x 8 mm)
Weight	0.55 ounce (15.6 grams)	1.74 ounces (49.2 grams)	4.9 ounces (140 grams)	5.7 ounces (162 grams)	4.2 ounces (120 grams)
Included accessories	Earphones, USB dock	Earphones, USB cable, dock adapter	Earphones, USB cable, dock adapter		Earphones, USB cable, dock adapter, polishing cloth, stand

#### Limited warranty and service

Your iPod comes with single-incident telephone support for the first 90 days and a one-year limited warranty. Purchase the AppleCare Protection Plan for iPod to extend your service and support to two years from your iPod purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

#### Options & Accessories

Available from the [Apple Online Store](#) or an [Apple Authorized Reseller](#).

##### Dock

- Apple Universal Dock with Remote MB125G/A
- iPod Universal Dock Adapter (3-pack) MB127G/A

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## Headphones

- In-Ear Headphones M9394G/A

## Services

- AppleCare Protection Plan MA518LL/A

## Cables and adapters

- Apple Component AV Cable MB128LL/A
- Apple Composite AV Cable MB129LL/A
- Apple USB Power Adapter MB051LL/A
- Apple iPod Dock Connector to USB 2.0 Cable MA591LL/A
- World Travel Adapter Kit M8794G/B

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Music capacity is based on 4 minutes per song and 128-Kbps AAC encoding; actual capacity varies by content.
3. Photo capacity is based on iPod-viewable photos transferred from iTunes.
4. Video capacity based on H.264 1.5-Mbps video at 640-by-480 resolution combined with 128-Kbps audio; actual capacity varies by content.
5. Internet access required; broadband recommended; fees may apply.
6. For iPod touch with Maps, the Maps application provides your approximate location using information based on your proximity to known Wi-Fi networks (when on and available). The more accurate the available information, the smaller the circle identifying your position on the map. The feature is not available in all areas. Known Wi-Fi networks are predominantly in urban areas. In order to provide your location, data is collected in a form that does not personally identify you. If you do not want such data collected, do not enable the feature. Not enabling the feature will not impact the functionality of your iPod touch.
7. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.
8. Testing conducted by Apple in January 2008 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (128-Kbps AAC); all settings were default except that Ask to Join Networks was turned off. Video content was purchased from the iTunes Store; all settings were default except that Ask to Join Networks and Auto-Brightness were turned off. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

Maps, directions, and location information depend on data collected by third parties. These data services are subject to change and may not be available in all geographic areas, resulting in maps, directions, or location information that may be unavailable, inaccurate, or incomplete.

Wi-Fi Internet access is required for some features; broadband recommended; fees may apply. Some features or services are not available in all areas.

Published Date: Apr 6, 2016

# Power Macintosh 9600/300: Technical Specifications

## Power Macintosh 9600/300

Logic Board	Ports	Power
Processor: 604e, 300	USB:	Max Watts: 560
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 1915.2
Data Path: 64, 100	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 64K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 1MB	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Soft Power: yes
Slots: 6 PCI	FireWire:	Pass Through: yes
Notes: One PCI slot occupied by video card. System supports 100 MHz cache bus, and 50 MHz system bus speeds.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory video card (8MB) (n/a)
RAM Slots: 12, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 64 MB - 768 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	24-bit
RAM Sizes: 8, 16, 32, 64MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
Notes: 128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	24-bit
	1152 x 870	24-bit
	1280 x 1024	24-bit
	Notes: A video card ships bundled with this system. The bundled video card is capable of resolutions up to 1600x1200.	
Physical	Software	Storage
Introduced: 8/5/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.6.1	Floppy Inject: manual
Form Factor: PM 9600	Orig Enabler: none	Min. Int HD Size: 4GB
Gestalt ID: 105	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 35	ROM Ver: n/a	Orig CD Speed: 24x
Dimensions (in): 17.3 H x 9.7 W x 17.3 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	Notes: Some systems shipped with an Iomega Zip drive.
	Mac OS Supported: 7.6.1 8.0 8.1 8.5 8.6 9	

# Power Macintosh 9600/350: Technical Specifications

## Power Macintosh 9600/350

Logic Board	Ports	Power
Processor: 604e, 350	USB:	Max Watts: 560
PMMU: integrated	ADB: 1	Amps: 3
FPU: integrated	Video: DB-15	BTU per Hr: 1915.2
Data Path: 64, 100	Floppy: none	Voltage: 100-125/200-240
L1 Cache: 64K	SCSI: DB-25	Freq Range: 50-60 Hz
L2 Cache: 1MB	Geoports: 2	Battery Type: 3.6V lithium
2nd Processor: opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Soft Power: yes
Slots: 6 PCI	FireWire:	Pass Through: yes
Notes: One PCI slot occupied by video card. System supports 100 MHz cache bus, and 50 MHz system bus speeds.	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory video card (8MB) (n/a)
RAM Slots: 12, 168-pin DIMM	512 x 384	24-bit
Min - Max RAM: 64 MB - 768 MB	640 x 400	n/a-bit
Min RAM Speed: 70	640 x 480	24-bit
RAM Sizes: 8, 16, 32, 64MB	800 x 600	24-bit
Install in Groups of: 1	832 x 624	24-bit
Notes: 128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	24-bit
	1152 x 870	24-bit
	1280 x 1024	24-bit
	Notes: A video card ships bundled with this system. The bundled video card is capable of resolutions up to 1600x1200.	
Physical	Software	Storage
Introduced: 8/5/1997	Addressing Modes: 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.6.1	Floppy Inject: manual
Form Factor: PM 9600	Orig Enabler: none	Min. Int HD Size: 4GB
Gestalt ID: 105	ROM ID: \$077D	Int HD Interface: SCSI
Weight (lbs): 35	ROM Ver: n/a	Orig CD Speed: 24x
Dimensions (in): 17.3 H x 9.7 W x 17.3 D	ROM Size: 4MB	Int CD Support: yes
	AppleTalk Ver: 60.1.1	Notes: System ships with an Iomega Zip drive.
	Mac OS Supported: 7.6.1 8.0 8.1 8.5 8.6 9	

# Apple Multiple Scan 15 Display:Technical Specifications

## Apple Multiple Scan 15 Display

Physical			Power		
Introduced:	7/1/1994		Max Watts:	90	
Discontinued:	n/a		Amps:	.75	
Tube Size:	15"		BTU per Hr:	307.8	
Viewable Size:	13.3" VIS		Voltage:	90-134/198-260	
Tube Type:	Shadow Mask		Freq Range:	47-63 Hz	
Weight (lbs):	31				
Dimensions (in):	16.7 H x 15.9 W x 17.8 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	60 Hz	31.77 kHz	64
	Macintosh	640x480	66.7 Hz	35.0 kHz	64
	SVGA	800x600	60 Hz	37.9 kHz	80
	SVGA	800x600	72 Hz	48.1 kHz	80
	Macintosh	832x624	75 Hz	49.7 kHz	83
	1024 x768	1024x768	70 Hz	56.5 kHz	102

# Apple Multiple Scan 15AV Display: Technical Specifications

## Apple Multiple Scan 15AV Display

Physical			Power		
Introduced:	9/14/1996		Max Watts:	75	
Discontinued:	n/a		Amps:	1.5	
Tube Size:	15"		BTU per Hr:	256.5	
Viewable Size:	13.75" VIS		Voltage:	90-132/198-265	
Tube Type:	Shadow Mask		Freq Range:	43-63 Hz	
Weight (lbs):	30				
Dimensions (in):	15.3 H x 14.8 W x 15.8 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	60 Hz	31.77 kHz	58
	Macintosh	640x480	66.7 Hz	35.0 kHz	58
	SVGA	800x600	60 Hz	37.9 kHz	73
	SVGA	800x600	72 Hz	48.1 kHz	73
	Macintosh	832x624	75 Hz	49.7 kHz	76
	VESA	1024x768	60 Hz	48.4 kHz	93
	1024 x768	1024x768	70 Hz	56.5 kHz	93
	Macintosh	1024x768	75 Hz	60.5 kHz	93



# Apple Multiple Scan 17 Display: Technical Specifications

## Apple Multiple Scan 17 Display

Physical			Power		
Introduced:	3/1/1994		Max Watts:	150	
Discontinued:	n/a		Amps:	1.25	
Tube Size:	17"		BTU per Hr:	513	
Viewable Size:	16.1" VIS		Voltage:	90-132/198-260	
Tube Type:	Trinitron		Freq Range:	47-63 Hz	
Weight (lbs):	50				
Dimensions (in):	16.7 H x 15.9 W x 17.8 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	59.95 Hz	31.47 kHz	50
	Macintosh	640x480	66.7 Hz	35.0 kHz	50
	VESA	640x480	75 Hz	37.5 kHz	50
	VESA	800x600	75 Hz	46.9 kHz	62
	SVGA	800x600	55.98 Hz	35.16 kHz	62
	800x600	800x600	60 Hz	37.8 kHz	62
	Macintosh	832x624	75 Hz	49.73 kHz	65
	Macintosh	1024x768	75 Hz	60.2 kHz	80
	1024x768	1024x768	60 Hz	48.3 kHz	80

# Power Macintosh G3 Mini Tower: Technical Specifications

## Power Macintosh G3 Mini Tower

Logic Board		Ports		Power	
Processor:	G3, 266	USB:		Max Watts:	240
PMMU:	integrated	ADB:	1	Amps:	8
FPU:	integrated	Video:	DB-15	BTU per Hr:	820.8
Data Path:	64, 66	Floppy:	none	Voltage:	100-240
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	512K	Geoports:		Battery Type:	3.6V lithium
2nd Processor:	none	Ethernet:	10baseT	Soft Power:	yes
Slots:	3 PCIs, 1 Comm	FireWire:		Pass Through:	yes
Notes:	*300 MHz option available	Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports: Printer Modem Speaker ,Headphone ,			
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory 2MB SGRAM (2x1MB)	Video Memory 4MB SGRAM (4x1MB)	Video Memory 6MB SGRAM (6x1MB)
RAM Slots:	3, 168-pin DIMM	512 x 384	32-bit	32-bit	32-bit
Min - Max RAM:	32 MB - 384 MB	640 x 400	32-bit	32-bit	32-bit
Min RAM Speed:	10	640 x 480	32-bit	32-bit	32-bit
RAM Sizes:	8,16,32,64,128 MB	800 x 600	24-bit	32-bit	32-bit
Install in Groups of:	1	832 x 624	24-bit	32-bit	32-bit
Notes:	DIMMs must be: ◆3.3 volt(V) unbuffered, 64-bit wide, 168-pin ◆100MHz/10ns cycle time or faster	1024 x 768	16-bit	32-bit	32-bit
		1152 x 870	16-bit	32-bit	32-bit
		1280 x 1024	8-bit	16-bit	32-bit
		Notes: Supports resolutions up to 1600x1200			
Physical		Software		Storage	
Introduced:	11/15/1997	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	1/1/1999	Orig SSW:	8.0	Floppy Inject:	manual
Form Factor:	PM G3	Orig Enabler:		Min. Int HD Size:	6GB
Gestalt ID:	510	ROM ID:	\$0770	Int HD Interface:	IDE
Weight (lbs):	33.1	ROM Ver:	1917	Orig CD Speed	24x
Dimensions (in):	15.2 H x 9.6 W x 17.8 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.2	Notes:	Also includes Zip Drive.
		Mac OS Supported:	8.0 8.1 8.5 8.5.1 8.6 9 X		

# Apple Multiple Scan 1705 Display:Technical Specifications

## Apple Multiple Scan 1705 Display

Physical			Power		
Introduced:	9/23/1995		Max Watts: 165		
Discontinued:	n/a		Amps: 2		
Tube Size:	17"		BTU per Hr: 564.3		
Viewable Size:	15.8" VIS		Voltage: 90-132/198-264		
Tube Type:	Shadow Mask		Freq Range: 47-63 Hz		
Weight (lbs):	45.2				
Dimensions (in):	17.2 H x 16.5 W x 18.8 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	60 Hz	31.5 kHz	
	Macintosh	640x480	67 Hz	35.0 kHz	
	VESA	640x480	75 Hz	37.5 kHz	
	EVGA	800x600	75 Hz	46.9 kHz	
	EVGA 60	800x600	60 Hz	37.9 kHz	
	Macintosh	832x624	75 Hz	47.74 kHz	
	Macintosh	1024x768	75 Hz	60.24 kHz	

# Twentieth Anniversary Macintosh: Technical Specifications

## Twentieth Anniversary Macintosh

Logic Board		Ports	Power
Processor:	603e, 250	USB:	Max Watts: 140
PMMU:	integrated	ADB: 1	Amps:
FPU:	integrated	Video: none	BTU per Hr: 478.8
Data Path:	64, 50	Floppy: none	Voltage: 90-130/180-264
L1 Cache:	32K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache:	256K	Geoports: 2	Battery Type: 4.5V alkaline
2nd Processor:	none	Ethernet: none	Soft Power: yes
Slots:	1 PCI, Comm II	FireWire:	
		Mic Type: PlainTalk	
		AirPort Ready:	
		Other Ports: Printer Modem Speaker ,Headphone ,Remote Control ,	
		Sound Notes: Bose Acoustimass sound system includes integrated stereo speakers and floor-standing bass unit.>	
Memory		Video Memory	
Logic Board:	none	Resolution	Video Memory 2MB SGRAM (built in)
RAM Slots:	2, 168-pin DIMM	512 x 384	n/a-bit
Min - Max RAM:	32 MB - 128 MB	640 x 400	n/a-bit
Min RAM Speed:	60	640 x 480	16-bit
RAM Sizes:	4, 8, 16, 32, 64 MB	800 x 600	16-bit
Install in Groups of:	1	832 x 624	n/a-bit
		1024 x 768	n/a-bit
		1152 x 870	n/a-bit
		1280 x 1024	n/a-bit
Physical		Software	Storage
Introduced:	6/1/1997	Addressing Modes:	32-bit
Discontinued:	n/a	Orig SSW:	7.6.1
Form Factor:	Twentieth Anniversary	Orig Enabler:	System Enabler 704
Gestalt ID:	512	ROM ID:	\$077D
Weight (lbs):	14.9	ROM Ver:	\$35
Dimensions (in):	17.25 H x 16.5 W x 10 D	ROM Size:	4MB
Notes:	Size and weight only represent main unit. Bass unit weighs 10.5 lbs and measures 10.63" x 8.31" x 11.75".	AppleTalk Ver:	60.1.1
		Mac OS Supported:	7.6.1 8.0 8.6 9 8.5 8.1
			Floppy Size: 1.44MB
			Floppy Inject: manual
			Min. Int HD Size: 2GB
			Int HD Interface: ATA
			Orig CD Speed: 4x
			Int CD Support: yes
			Notes: CD-ROM drive is mounted vertically on front of system.

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# Apple Multiple Scan 20 Display: Technical Specifications

## Apple Multiple Scan 20 Display

Physical			Power		
Introduced:	3/1/1994		Max Watts:	165	
Discontinued:	n/a		Amps:	1.38	
Tube Size:	20"		BTU per Hr:	564.3	
Viewable Size:	19.1" VIS		Voltage:	90-132/198-260	
Tube Type:	Trinitron		Freq Range:	47-63 Hz	
Weight (lbs):	66				
Dimensions (in):	18.7 H x 18.7 W x 19.7 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	59.95 Hz	31.47 kHz	42
	Macintosh	640x480	66.7 Hz	35.0 kHz	42
	VESA	640x480	75 Hz	37.5 kHz	42
	VESA	800x600	75 Hz	46.9 kHz	53
	Macintosh	832x624	75 Hz	49.73 kHz	55
	Macintosh	1024x768	74.93 Hz	60.24 kHz	68
	VESA	1024x768	75 Hz	60.02 kHz	68
	Macintosh	1152x870	75 Hz	68.7 kHz	77
	VESA	1280x1024	75 Hz	79.98 kHz	88

# iMac G5 (iSight) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iMac G5 (iSight) - Technical Specifications

Configurations	1.9GHz 17-inch iMac	2.1GHz 20-inch iMac
Model	MA063LL/A	MA064LL/A
Processor	1.9GHz PowerPC G5	2.1GHz PowerPC G5
L2 Cache	512K	
Frontside bus	633MHz	700MHz
Memory	512MB of 533MHz DDR2 SDRAM (PC2-4200), supports up to 2.5GB	
Hard drive <sup>1</sup>	160GB Serial ATA <sup>1</sup> ; 7200 rpm	250GB Serial ATA <sup>1</sup> ; 7200 rpm
Optical drive	Slot-loading 8x SuperDrive (DVD+R DL/DVD±RW/CD-RW)	
Display	17-inch (viewable) widescreen TFT active-matrix LCD, 1440 x 900 pixels, millions of colors	20-inch (viewable) widescreen TFT active-matrix LCD, 1680 x 1050 pixels, millions of colors
Video camera	Built-in iSight	
Graphics	ATI Radeon X600 Pro with 128MB DDR SDRAM; PCI-Express	ATI Radeon X600 XT with 128MB DDR SDRAM; PCI-Express
Ports	Two FireWire 400 ports; three USB 2.0 ports, two USB 1.1 ports (on keyboard); VGA output <sup>(2)</sup> ; S-video and composite video output <sup>(2)</sup>	
Audio	Built-in stereo speakers, built-in microphone, headphone/optical digital audio output, audio line in	
Networking	Built-in 10/100/1000BASE-T (Gigabit)	
Wireless	Built-in 54 Mbps AirPort Extreme Wi-Fi (802.11g) <sup>3</sup> ; built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module.	
Hardware accessories	Apple Remote, Apple Keyboard, Mighty Mouse	
System software	Mac OS X version 10.4 Tiger	
Software	Front Row, iLife '05 (includes iTunes, iPhoto, iMovie HD, iDVD, GarageBand), Photo Booth, Mail, Dashboard, Spotlight, iChat, Safari, Sherlock, QuickTime, iSync, iCal, DVD Player, Address Book, AppleWorks, iWork (30-day trial), Classic environment, Quicken 2006 for Mac, 2006 World Book, Nanosaur 2, Marble Blast Gold, Microsoft Office 2004 for Mac Test Drive, Zinio Reader, XCode Developer Tools and Apple Hardware Test	
Limited warranty and service	Your iMac G5 comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	

Build-to-Order Options	Order a custom-configured computer from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Memory	512MB, 1GB, 1.5GB or 2.5GB PC2-4200 (533MHz) DDR2 SDRAM
Hard Drive <sup>(2)</sup>	250GB or 500GB Serial ATA; 7200 rpm
Wireless	AirPort Express Featuring AirTunes M9470LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269Z/A
Cables and adapters	Apple VGA Display Adapter M8639G/A Apple Video Adapter M9109G/A Apple FireWire Cable (4-pin to 6-pin) M8706G/A
DVD	Apple 8x DVD-R Media Kit M9472G/A
Audio	Apple iPod
Modem	Apple USB Modem MA034Z/A
Services	AppleCare Protection Plan M8851LL/A .Mac Subscription: Retail Box MA175Z/A Family Pack MA176Z/A

### Technical Specifications

#### Processor and memory

- 1.9GHz or 2.1GHz PowerPC G5 processor with Velocity Engine
- 512K on-chip level 2 cache at full processor speed

# 40\_iMac G5 (iSight) - Technical Specifications.pdf

- 633MHz or 700MHz frontside bus
- 512MB of PC2-4200 (533MHz) DDR2 SDRAM expandable to 2.5GB; one memory slot

## Storage

- 160 or 250GB 7200-rpm Serial ATA hard disk drive
- 8x SuperDrive (DVD+R DL/DVD±RW/CD-RW) installed; writes DVD+R DL discs at up to 2.4x speed, writes DVD-R and DVD+R discs at up to 8x speed, writes DVD-RW and DVD+RW discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 24x speed

## Communications

- Built-in 54-Mbps AirPort Extreme Card (802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability)<sup>3</sup>
- Built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module
- Built-in 10/100/1000 Gigabit BASE-T Ethernet (RJ-45 connector)
- Works with 56K V.92 modem (RJ-11 connector) Apple USB Modem

## Peripheral connections

- Two FireWire 400 ports; 8 watts shared
- Total of five USB ports: three USB 2.0 ports (up to 480 Mbps) on computer, two USB 1.1 ports on keyboard

## Display

- Built-in 17-inch (viewable) widescreen or 20-inch (viewable) widescreen TFT active-matrix liquid crystal display
- Millions of colors at all resolutions
- Typical viewing angle:
  - 17-inch model
    - 140° horizontal
    - 120° vertical
  - 20-inch model
    - 170° horizontal
    - 170° vertical
- Typical brightness: 250 cd/m (17-inch model); 280 cd/m (20-inch model)
- Typical contrast ratio: 500:1 (17-inch model); 800:1 (20-inch model)

## Graphics support

- ATI Radeon X600 Pro (17-inch model) or XT (20-inch model) graphics processor using PCI-Express
- 128MB of dedicated Double Data Rate (DDR) video memory
- 17-inch display resolutions:
  - 16:10 aspect ratio
    - 1440 x 900 pixels (native)
    - 1152 x 720
    - 1024 x 640
    - 800 x 500
  - 4:3 aspect ratio
    - 1024 x 768 pixels
    - 800 x 600
    - 640 x 480
- 20-inch display resolutions:
  - 16:10 aspect ratio
    - 1680 x 1050 pixels (native)
    - 1344 x 840
    - 1280 x 800
    - 1024 x 640
    - 840 x 524
    - 800 x 500
  - 4:3 aspect ratio
    - 1024 x 768 pixels
    - 800 x 600
    - 640 x 480

## Video

- Built-in iSight camera
- VGA output port for video mirroring on external display or projector<sup>2</sup>
- S-video and composite video output to connect directly to a TV or projector<sup>2</sup>

## Audio

- Built-in stereo speakers
- Internal 12-watt digital amplifier
- Headphone/optical digital audio output
- Audio line input
- Built-in microphone



# 40\_iMac G5 (iSight) - Technical Specifications.pdf

**Electrical and environmental requirements**

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 180W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

**Size and weight (17-inch)**

- Height: 16.9 inches (43.0 cm)
- Width: 16.8 inches (42.6 cm)
- Depth: 6.8 inches (17.3 cm)
- Weight: 15.5 pounds (7 kg)<sup>4</sup>

**Size and weight (20-inch)**

- Height: 18.6 inches (47.2 cm)
- Width: 19.4 inches (49.3 cm)
- Depth: 7.4 inches (18.9 cm)
- Weight: 22 pounds (10 kg)<sup>4</sup>

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Requires adapter, sold separately.
3. Wireless Internet access requires AirPort Express or AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.
4. Weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply.  
Product contains electronic documentation.  
Backup copy of software is included.

Published Date: Apr 6, 2016

# Apple Multiple Scan 720 Display: Technical Specifications

## Apple Multiple Scan 720 Display

Physical			Power		
Introduced:	10/8/1997		Max Watts: 120		
Discontinued:	n/a		Amps: 2		
Tube Size:	17"		BTU per Hr: 410.4		
Viewable Size:	16" VIS		Voltage: 90-134/198-260		
Tube Type:	Shadow Mask		Freq Range: 47-63 Hz		
Weight (lbs):	37.5				
Dimensions (in):	17 H x 16.2 W x 16.9 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	VGA	640x480	60Hz	31.5kHz	
	Macintosh	640x480	66.7Hz	35kHz	
	VESA	640x480	85Hz	43.26KHz	
	VESA	800x600	60Hz	37.87kHz	
	VESA	800x600	85Hz	53.67kHz	
	Macintosh	832x624	75Hz	49.72kHz	
	VESA	1024x768	60Hz	48.36kHz	
	VESA	1024x768	75Hz	56.47kHz	
	Macintosh	1152x870	70Hz	68.681kHz	
	VESA	1280x1024	60Hz	63.8kHz	

Published Date: Jul 25, 2017

# Power Mac and Performa 5200-series built-in display - Technical Specifications

## 5200-series built-in display

Physical			Power		
Introduced:	4/1/1995		Max Watts: 1		
Discontinued:	n/a		Amps: 1		
Tube Size:	15"		BTU per Hr:		
Viewable Size:	12.8" VIS		Voltage: n/a		
Tube Type:	Shadow Mask		Freq Range: n/a Hz		
Weight (lbs):	n/a				
Dimensions (in):	n/a				
Modes					
Mode	Resolution	Vert Rate	Horiz Rate	DPI	
VGA	640x480	60 Hz	31.77 kHz	62	
Macintosh	640x480	66.7 Hz	35.0 kHz	62	
SVGA	800x600	60 Hz	37.9 kHz	78	
SVGA	800x600	72 Hz	48.1 kHz	78	
Macintosh	832x624	75 Hz	49.7 kHz	81	

# Apple AudioVision 14 Display: Technical Specifications

## Apple AudioVision 14 Display

Physical		Power		
Introduced:	8/1/1993	Max Watts:	55	
Discontinued:	10/14/1995	Amps:	.46	
Tube Size:	14"	BTU per Hr:	188.1	
Viewable Size:	13"	Voltage:	100-240	
Tube Type:	Trinitron	Freq Range:	47-63 Hz	
Weight (lbs):	25			
Dimensions (in): 15.2 H x 13.4 W x 16.6 D				
Modes				
Mode	Resolution	Vert Rate	Horiz Rate	DPI
Macintosh	640x480	66.7 Hz	35 kHz	69

# Apple Basic Color Monitor: Technical Specifications

## Apple Basic Color Monitor

Physical			Power		
Introduced:	2/1/1993		Max Watts:	70	
Discontinued:	10/1/1993		Amps:	.58	
Tube Size:	14"		BTU per Hr:	239.4	
Viewable Size:	13"		Voltage:	100-125	
Tube Type:	Shadow Mask		Freq Range:	50-60 Hz	
Weight (lbs):	25.3				
Dimensions (in):	12.9 H x 14.5 W x 15.2 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	640x480	59.94 Hz	31.5 kHz	68

# Apple Color Plus 14" Display:Technical Specifications

## Apple Color Plus 14" Display

Physical		Power			
Introduced:	10/1/1993	Max Watts:	70		
Discontinued:	n/a	Amps:	.58		
Tube Size:	14"	BTU per Hr:	239.4		
Viewable Size:	11.9" VIS	Voltage:	100-125		
Tube Type:	Shadow Mask	Freq Range:	50-60 Hz		
Weight (lbs):	26				
Dimensions (in):	14.2 H x 14.2 W x 16 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	640x480	66.7 Hz	35 kHz	68

# Apple High-Resolution Monochrome Monitor: Technical Specifications

## Apple High-Resolution Monochrome Monitor

Physical		Power			
Introduced:	3/1/1989	Max Watts:	40		
Discontinued:	2/1/1991	Amps:	.33		
Tube Size:	12"	BTU per Hr:	136.8		
Viewable Size:	11"	Voltage:	100-240		
Tube Type:	Shadow Mask	Freq Range:	50-60 Hz		
Weight (lbs):	17				
Dimensions (in):	10 H x 12.2 W x 14.4 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	640x480	66.7 Hz	35 kHz	76

# AppleColor High-Resolution RGB Monitor:Technical Specifications

## AppleColor High-Resolution RGB Monitor

Physical		Power			
Introduced:	3/1/1987	Max Watts:	160		
Discontinued:	12/1/1992	Amps:	1.3		
Tube Size:	13"	BTU per Hr:	547.2		
Viewable Size:	12.8"	Voltage:	85-270		
Tube Type:	Trinitron	Freq Range:	47-63 Hz		
Weight (lbs):	n/a				
Dimensions (in):	11 H x 13.5 W x 16 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	640x480	66.7 Hz	35 kHz	69



# Color Classic built-in display:Technical Specifications

## Color Classic built-in display

Physical		Power		
Introduced:	2/1/1993	Max Watts:	1	
Discontinued:	5/1/1994	Amps:	1	
Tube Size:	10"	BTU per Hr:		
Viewable Size:	8.2"	Voltage:	n/a	
Tube Type:	Trinitron	Freq Range:	n/a Hz	
Weight (lbs):	n/a			
Dimensions (in):	n/a			
Modes				
Mode	Resolution	Vert Rate	Horiz Rate	DPI
Macintosh	512x384	60.15 Hz	24.48 kHz	
Apple IIe	560x384	60.15 Hz	24.48 kHz	

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# Fifth Generation iPod (iPod with video) 30 GB, 60 GB - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Fifth Generation iPod (iPod with video) 30 GB, 60 GB - Technical Specifications

Configurations	iPod
Model	MA002LL/A (30GB white) MA146LL/A (30GB black) MA003LL/A (60GB white) MA147LL/A (60GB black)
Storage <sup>(1)</sup> and song capacity <sup>(2)</sup>	30GB (7,500 songs) or 60GB (15,000 songs)
Battery life <sup>(3)</sup>	30GB: Up to 14 hours of music playback; up to 3 hours of slideshows with music; up to 2 hours of video playback 60GB: Up to 20 hours of music playback; up to 4 hours of slideshows with music; up to 3 hours of video playback
Display	2.5-inch (diagonal) color LCD with LED backlight
iPod Ports	Dock connector, stereo minijack, composite video and audio through minijack
Connectivity	USB through Dock connector; composite video (with AV cable, sold separately) and audio through headphone jack or line out on the iPod Universal Dock (sold separately)
Charge time	About 4 hours (2-hour fast charge to 80% capacity)
Audio support	AAC (16 to 320 Kbps), Protected AAC (from iTunes Music Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3 and 4), Apple Lossless, WAV, AIFF
Photo support	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only) and PNG formats
Video support	H.264 video: up to 768 Kbps, 320 x 240, 30 frames per sec., Baseline Profile up to Level 1.3 with AAC-LC up to 160 Kbps, 48 Khz, stereo audio in .m4v, .mp4 and .mov file formats MPEG-4 video: up to 2.5 mbps, 480 x 480, 30 frames per sec., Simple Profile with AAC-LC up to 160 Kbps, 48 Khz, stereo audio in .m4v, .mp4 and .mov file formats
Size (in inches)	4.1 x 2.4 x 0.43 4.1 x 2.4 x 0.55
Weight	4.8 ounces 5.5 ounces
Included software <sup>(4)</sup>	iTunes for Mac and Windows
Included accessories	Earbud headphones, USB cable, Dock Adapter, case
Documentation	Electronic Features Guide and Printed Quick Start Guide
Limited warranty and service	Your iPod comes with single incident telephone support for the first 90 days and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> for iPod to extend your service and support to two full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.

Options & Accessories: iPod	Available from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Dock and cases	iPod Universal Dock MA045G/A iPod Socks (set of five: green, purple, gray, blue, orange and pink) M9720G/A
Remote control	Apple Remote MA128G/A
Cables and adapters	iPod Camera Connector M9861G/A iPod AV Cable M9765G/A iPod USB Power Adapter M9837LL/A USB 2.0 to Apple iPod Dock Connector Cable M9569G/A World Travel Adapter Kit M8794G/B
Headphones	In-Ear Headphones M9394G/A
Services	AppleCare Protection Plan M9404LL/A

### Technical Specifications: iPod

<b>Capacity</b> <ul style="list-style-type: none"><li>■ 30GB or 60GB hard drive<sup>(1)</sup></li><li>■ Holds 7,500 to 15,000 songs in 128-Kbps AAC format<sup>(2)</sup></li><li>■ Holds up to 25,000 iPod-viewable photos<sup>(2)</sup></li><li>■ Holds over 1,000 (30GB) or 2,000 (60GB) videos<sup>(2)</sup></li><li>■ Stores data via USB hard drive</li></ul>	<b>Mac system requirements</b> <ul style="list-style-type: none"><li>■ Macintosh computer with USB port (USB 2.0 recommended)</li><li>■ Mac OS X v10.3.9 or later</li></ul> <b>Windows system requirements</b> <ul style="list-style-type: none"><li>■ PC with USB port or card (USB 2.0 recommended)</li><li>■ Windows 2000 with Service Pack 4 or later, or Windows XP Home or Professional with Service Pack 2 or later</li></ul>	<b>Environmental requirements</b> <ul style="list-style-type: none"><li>■ Operating temperature: 32° to 95° F (0° to 35° C)</li><li>■ Non operating temperature: -4° to 113° F (-20° to 45° C)</li><li>■ Relative humidity: 5% to 95% noncondensing</li><li>■ Maximum operating altitude: 10,000 feet (3000 m)</li></ul>
<b>Display</b> <ul style="list-style-type: none"><li>■ 2.5 inch (diagonal) QVGA transfective, over 65,000-color liquid crystal display with white LED backlight</li><li>■ 320 x 240 pixel resolution, .156-mm dot pitch</li><li>■ Support for display of multiple languages and characters simultaneously</li></ul>	<b>Customizable settings</b> <ul style="list-style-type: none"><li>■ Customize main menu</li><li>■ Create multiple On-the-Go playlists</li><li>■ Adjust audiobook playback speed</li><li>■ Clicker playback through headphones</li><li>■ Rate songs</li><li>■ Shuffle songs or albums</li><li>■ Repeat one or all</li><li>■ Sound Check on or off</li><li>■ 20 Equalizer settings</li><li>■ Backlight timer</li><li>■ Alarms on, off or silent</li><li>■ Sleep timer</li><li>■ Date and time</li><li>■ Display time in menu bar</li><li>■ Contacts sort and display by first or last names</li><li>■ Clicker on or off</li><li>■ Photo slideshow settings:<ul style="list-style-type: none"><li>○ Music from Now Playing, iPhoto (Mac), or iTunes playlists</li><li>○ Time per slide (manual) 2, 3, 5, 10, or 20 seconds</li><li>○ Repeat on or off</li><li>○ Shuffle photos on or off</li><li>○ Transitions off, random, cube across, cube down, dissolve, page flip, push across, push down, radial, swirl, wipe across, wipe down, wipe from center</li><li>○ TV out on, off or ask</li><li>○ TV signal PAL or NTSC</li></ul></li><li>■ Voice recording settings:<ul style="list-style-type: none"><li>○ Low (22.05 KHz, mono)</li><li>○ High (44.1 KHz, stereo)</li></ul></li><li>■ Languages: Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Swedish, Traditional Chinese and Turkish</li><li>■ Additional language support for display of song, album and artist information: Bulgarian, Croatian, Romanian, Serbian, Slovak, Slovenian and Ukrainian</li></ul>	<b>Input and output</b> <ul style="list-style-type: none"><li>■ iPod<ul style="list-style-type: none"><li>○ Dock connector</li><li>○ 3.5-mm stereo headphone minijack</li></ul></li><li>■ iPod Universal Dock<ul style="list-style-type: none"><li>○ Dock connector</li><li>○ Audio and composite video output</li><li>○ S-video output</li></ul></li></ul>
<b>Audio</b> <ul style="list-style-type: none"><li>■ Frequency response: 20Hz to 20,000Hz</li><li>■ Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Music Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3 and 4), Apple Lossless, AIFF and WAV</li><li>■ Upgradable firmware enables support for future audio formats</li></ul>		<b>Power and battery<sup>(3)</sup></b> <ul style="list-style-type: none"><li>■ Built-in rechargeable lithium ion battery</li><li>■ Playback time (30GB model)<ul style="list-style-type: none"><li>○ Music playback time: Up to 14 hours when fully charged</li><li>○ Photo slideshow with music viewing time: Up to 3 hours when fully charged</li><li>○ Video playback time: Up to 2 hours when fully charged</li></ul></li><li>■ Playback time (60GB model)<ul style="list-style-type: none"><li>○ Music playback time: Up to 20 hours when fully charged</li><li>○ Photo slideshow with music viewing time: Up to 4 hours when fully charged</li><li>○ Video playback time: Up to 3 hours when fully charged</li></ul></li><li>■ Charging via USB or FireWire to computer system or power adapter (sold separately)<ul style="list-style-type: none"><li>○ Fast-charge time: about 2 hours (charges up to 80% of battery capacity)</li><li>○ Full-charge time: about 4 hours</li></ul></li></ul>
<b>Video</b> <ul style="list-style-type: none"><li>■ Video formats supported: H.264 video up to 768 Kbps, 320 x 240, 30 frames per sec., Baseline Profile up to Level 1.3 with AAC-LC up to 160 Kbps, 48 KHz, stereo audio in .m4v, .mp4 and .mov file formats; MPEG-4 video up to 2.5 Mbps, 480 x 480, 30 frames per sec., Simple Profile with AAC-LC up to 160 Kbps, 48 KHz, stereo audio in .m4v, .mp4 and .mov file formats</li><li>■ Upgradable firmware enables support for future video formats</li></ul>		<b>Size and weight (30GB model)</b> <ul style="list-style-type: none"><li>■ Height: 4.1 inches</li><li>■ Width: 2.4 inches</li><li>■ Depth: 0.43 inches</li><li>■ Weight: 4.8 oz</li></ul> <b>Size and weight (60GB model)</b> <ul style="list-style-type: none"><li>■ Height: 4.1 inches</li><li>■ Width: 2.4 inches</li><li>■ Depth: 0.55 inches</li><li>■ Weight: 5.5 oz</li></ul>
<b>Headphones</b> <ul style="list-style-type: none"><li>■ Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets</li><li>■ Frequency response: 20Hz to 20,000Hz</li><li>■ Impedance: 32 ohms</li></ul>		

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Song capacity is based on 4 minutes per song and 128-Kbps AAC encoding; photo capacity is based on iPod-viewable photos transferred from iTunes; video capacity is based on 4 minutes per H.264 750-Kbps video combined with 128-Kbps audio.

3. Up to 20 hours of battery life refers to 60GB model and music playback.

4. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

# Macintosh 12-inch Monochrome Display: Technical Specifications

## Macintosh 12-inch Monochrome Display

Physical		Power			
Introduced:	12/1/1990	Max Watts:	30		
Discontinued:	10/1/1993	Amps:	.25		
Tube Size:	12"	BTU per Hr:	102.6		
Viewable Size:	11.5"	Voltage:	90-270		
Tube Type:	Shadow Mask	Freq Range:	47-63 Hz		
Weight (lbs):	16				
Dimensions (in):	12.2 H x 14.4 W x 10.2 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	640x480	66.7 Hz	35 kHz	76

# Macintosh 12-inch RGB Display:Technical Specifications

## Macintosh 12-inch RGB Display

Physical			Power	
Introduced:	10/1/1990		Max Watts:	90
Discontinued:	3/1/1993		Amps:	.75
Tube Size:	12"		BTU per Hr:	307.8
Viewable Size:	11.5"		Voltage:	110
Tube Type:	Shadow Mask		Freq Range:	50-60 Hz
Weight (lbs):	24			
Dimensions (in):	12.2 H x 14.4 W x 10.2 D			
Modes				
	Mode	Resolution	Vert Rate	Horiz Rate      DPI
	Macintosh	512x384	60.15 Hz	24.48 kHz    64

# Macintosh 16-inch Color Display

## Macintosh 16-inch Color Display

Physical		Power			
Introduced:	10/1/1991	Max Watts:	130		
Discontinued:	4/1/1994	Amps:	1.18		
Tube Size:	16"	BTU per Hr:	444.6		
Viewable Size:	16"	Voltage:	90-270		
Tube Type:	Trinitron	Freq Range:	47-63 Hz		
Weight (lbs):	47				
Dimensions (in):	16.5 H x 16 W x 17.6 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	832x624	75 Hz	50 kHz	70

# Macintosh 21-inch Color Display: Technical Specifications

## Macintosh 21-inch Color Display

Physical		Power			
Introduced:	10/1/1991	Max Watts:	165		
Discontinued:	3/1/1994	Amps:	1.38		
Tube Size:	21"	BTU per Hr:	564.3		
Viewable Size:	19"	Voltage:	120		
Tube Type:	Shadow Mask	Freq Range:	47-63 Hz		
Weight (lbs):	79.6				
Dimensions (in):	18.5 H x 19.6 W x 20.9 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	1152x870	75 Hz	68.7 kHz	79

# Macintosh Color Display: Technical Specifications

## Macintosh Color Display

Physical		Power			
Introduced:	12/1/1992	Max Watts:	55		
Discontinued:	n/a	Amps:	.46		
Tube Size:	14"	BTU per Hr:	188.1		
Viewable Size:	11.5" VIS	Voltage:	90-270		
Tube Type:	Trinitron	Freq Range:	47-63 Hz		
Weight (lbs):	25				
Dimensions (in):	13 H x 13.4 W x 14 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	640x480	66.7 Hz	35 kHz	70



# Macintosh LC/Performa 580 built-in display:Technical Specifications

## Macintosh LC/Performa 580 built-in display

Physical		Power		
Introduced:	4/1/1995	Max Watts:	1	
Discontinued:	n/a	Amps:	1	
Tube Size:	14"	BTU per Hr:		
Viewable Size:	13"	Voltage:	n/a	
Tube Type:	Shadow Mask	Freq Range:	n/a Hz	
Weight (lbs):	n/a			
Dimensions (in):	n/a			
Modes				
Mode	Resolution	Vert Rate	Horiz Rate	DPI
Macintosh	640x480	66.67 Hz	35 kHz	68

# Macintosh Portrait Display:Technical Specifications

## Macintosh Portrait Display

Physical		Power			
Introduced:	3/1/1989	Max Watts:	75		
Discontinued:	12/1/1992	Amps:	.6		
Tube Size:	15"	BTU per Hr:	256.5		
Viewable Size:	14.2"	Voltage:	90-270		
Tube Type:	Shadow Mask	Freq Range:	47-63 Hz		
Weight (lbs):	35				
Dimensions (in): 13.1 H x 11.5 W x 14.9 D					
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	640x870	75 Hz	68.85 kHz	80

# Macintosh TV, 520- thru 570-series built-in display:Technical Specifications

## Macintosh TV, 520- thru 570-series built-in display

Physical			Power	
Introduced:	6/1/1993		Max Watts:	1
Discontinued:	4/1/1995		Amps:	1
Tube Size:	14"		BTU per Hr:	
Viewable Size:	13"		Voltage:	n/a
Tube Type:	Trinitron		Freq Range:	n/a Hz
Weight (lbs):	n/a			
Dimensions (in):	n/a			
Modes				
Mode	Resolution	Vert Rate	Horiz Rate	DPI
Macintosh	640x480	66.62 Hz	34.975 kHz	70

Published Date: Jul 25, 2017

# Performa Display: Technical Specifications

## Performa Display

Physical				Power	
Introduced:	9/1/1992			Max Watts:	85
Discontinued:	7/1/1994			Amps:	.71
Tube Size:	14"			BTU per Hr:	290.7
Viewable Size:	13"			Voltage:	98-132
Tube Type:	Shadow Mask			Freq Range:	57-63 Hz
Weight (lbs):	35				
Dimensions (in):	12.75 H x 13.9 W x 14.75 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	640x480	66.7 Hz	35 kHz	67

# iPod nano - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iPod nano - Technical Specifications

Configurations	iPod nano
Model	MA350LL/A <sup>(1GB white)</sup> MA352LL/A <sup>(1GB black)</sup> MA004LL/A <sup>(2GB white)</sup> MA099LL/A <sup>(2GB black)</sup> MA005LL/A <sup>(4GB white)</sup> MA107LL/A <sup>(4GB black)</sup>
Storage <sup>(1)</sup> and song capacity <sup>(2)</sup>	1GB (240 songs), 2GB (500 songs) or 4GB (1,000 songs)
Battery life <sup>(3)</sup>	Up to 14 hours of music playback; up to 4 hours of slideshows with music
Display	1.5-inch (diagonal) color LCD with LED backlight
iPod Ports	Dock connector, stereo minijack
Connectivity	USB through Dock connector
Charge time	About 3 hours (1.5-hour fast charge to 80% capacity)
Audio support	AAC (16 to 320 Kbps), Protected AAC (from iTunes Music Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3 and 4), Apple Lossless, WAV, AIFF
Photo support	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only) and PNG formats
Video support	
Size (in inches)	3.5 x 1.6 x 0.27
Weight	1.5 ounces
Included software <sup>(4)</sup>	iTunes for Mac and Windows
Included accessories	Earbud headphones, USB cable, Dock Adapter
Documentation	Electronic Features Guide and Printed Quick Start Guide
Limited warranty and service	Your iPod comes with single incident telephone support for the first 90 days and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> for iPod to extend your service and support to two full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.

Options & Accessories: iPod nano	Available from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Cables and adapters	iPod USB Power Adapter M9837LL/A USB 2.0 to Apple iPod Dock Connector Cable M9569G/A World Travel Adapter Kit M8794G/B
Dock	iPod nano Dock MA072G/A
Headphones	In-Ear Headphones M9394G/A
Accessories	iPod nano Lanyard Headphones MA093G/A iPod nano Armband (Gray) MA094G/A iPod nano Armband (Blue) MA183G/A iPod nano Armband (Pink) MA184G/A iPod nano Armband (Green) MA185G/A iPod nano Armband (Red) MA186G/A iPod nano Tubes (set of five: clear, pink, blue, purple and green) MA241G/A
Services	AppleCare Protection Plan M9404LL/A

### Technical Specifications: iPod nano

#### Capacity

- 1GB, 2GB or 4GB flash drive<sup>(1)</sup>
- Holds 240 to 1,000 songs in 128-Kbps AAC format<sup>(2)</sup>
- Holds 15,000 to 25,000 iPod nano-viewable photos<sup>(2)</sup>
- Stores data via USB flash drive

#### Display

- 1.5 inch (diagonal) liquid crystal display with blue-white LED backlight
- 176 x 132 pixel resolution, .168-mm dot pitch

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- Support for display of multiple languages and characters simultaneously

## Audio

- Skip-free playback
- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Music Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3 and 4), Apple Lossless, AIFF and WAV
- Upgradable firmware enables support for future audio formats

## Headphones

- Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Mac system requirements

- Macintosh computer with USB port (USB 2.0 recommended)
- Mac OS X v10.3.4 or later

## Windows system requirements

- PC with USB port or card (USB 2.0 recommended)
- Windows 2000 with Service Pack 4 or later, or Windows XP Home or Professional with Service Pack 2 or later

## Customizable settings

- Customize main menu
- Create multiple On-the-Go playlists
- Adjust audiobook playback speed
- Clicker playback through headphones
- Rate songs
- Shuffle songs or albums
- Repeat one or all
- Sound Check on or off
- 20 Equalizer settings
- Backlight timer
- Alarms on, off or silent
- Sleep timer
- Date and time
- Display time in menu bar
- Contacts sort and display by first or last names
- Clicker on or off
- Languages: Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Swedish, Traditional Chinese and Turkish
- Additional language support for display of song, album and artist information: Bulgarian, Croatian, Romanian, Serbian, Slovak, Slovenian and Ukrainian

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Non operating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Input and output

- Dock connector
- 3.5-mm stereo headphone jack

## Power and battery <sup>(3)</sup>

- Built-in rechargeable lithium ion battery
- Playtime: Up to 14 hours when fully charged<sup>(3)</sup>
- Photo slideshow with music viewing time: Up to 4 hours when fully charged<sup>(3)</sup>
- Charging via USB or FireWire to computer system or power adapter (sold separately)
  - Fast-charge time: about 1.5 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 3 hours

## Size and weight

- Height: 3.5 in
- Width: 1.6 in
- Depth: 0.27 in
- Weight: 1.5 oz

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Song capacity is based on 4 minutes per song and 128-Kbps AAC encoding; photo capacity is based on iPod-viewable photos transferred from iTunes. 25,000 photos refers to 2GB and 4GB iPod nano. 1GB iPod nano holds up to 15,000 photos.

3. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

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4. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Apr 6, 2016

# Performa Plus Display

## Performa Plus Display

Physical				Power	
Introduced:	9/1/1992			Max Watts:	85
Discontinued:	n/a			Amps:	.71
Tube Size:	14"			BTU per Hr:	290.7
Viewable Size:	13"			Voltage:	98-132
Tube Type:	Shadow Mask			Freq Range:	57-63 Hz
Weight (lbs):	35				
Dimensions (in):	12.75 H x 13.9 W x 14.75 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	640x480	66.7 Hz	35 kHz	67



# Two-Page Monochrome Display: Technical Specifications

## Two-Page Monochrome Display

Physical		Power			
Introduced:	3/1/1989	Max Watts:	95		
Discontinued:	12/1/1992	Amps:	.8		
Tube Size:	21"	BTU per Hr:	324.9		
Viewable Size:	19"	Voltage:	90-270		
Tube Type:	Shadow Mask	Freq Range:	47-63 Hz		
Weight (lbs):	60				
Dimensions (in): 19.1 H x 19.6 W x 18.6 D					
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Macintosh	1152x870	75 Hz	68.7 kHz	77

# LaserWriter 4/600 PS:Technical Specifications

## LaserWriter 4/600 PS

Logic Board	Ports	Power
Processor: AMD 29200, 16 MHz PD Language: PostScript Level 2	Ports: LocalTalk	Max Watts: 450 Amps: 3.75 BTU per Hr: 1539 Voltage: 100-115 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 4MB RAM Slots: 1 , card Min - Max RAM: 2MB - 6MB Min RAM Speed: n/a RAM Sizes: 4 MB	Pages Per Min: 4 Max DPI: 600 Min Life: 100,000	Introduced: 6/1/1995 Discontinued: n/a Weight (lbs): 15.4 Dimensions (in): 6.3 H x 15.2 W x 14.9 D

Published Date: Jul 25, 2017

# LaserWriter Select 360: Technical Specifications

## LaserWriter Select 360

Logic Board	Ports	Power
Processor: AMD29200, 16 MHz PD Language: PostScript Level 2PCL 5	Ports: LocalTalk RS-232/RS-422 serial Centronics parallel	Max Watts: 450 Amps: 3.75 BTU per Hr: 1539 Voltage: 100-115 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 4MB RAM Slots: 1 , 72-pin Min - Max RAM: 7MB - 16MB Min RAM Speed: 80 ns RAM Sizes: 4, 16MB	Pages Per Min: 10 Max DPI: 600 Min Life: 300,000	Introduced: 10/1/1993 Discontinued: 4/22/1996 Weight (lbs): 29 Dimensions (in): 8 H x 15 W x 18.3 D

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# LaserWriter Select 310:Technical Specifications

## LaserWriter Select 310

Logic Board	Ports	Power
Processor: AMD29205, 7.25 MHz PD Language: PostScript Level 1	Ports: serial Centronics parallel	Max Watts: 450 Amps: 3.75 BTU per Hr: 1539 Voltage: 110-115 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 2MB RAM Slots: 1 , 72-pin Min - Max RAM: 1.5MB - 5.5MB Min RAM Speed: 100 ns RAM Sizes: 1, 4MB	Pages Per Min: 5 Max DPI: 300 Min Life: 150,000	Introduced: 2/1/1993 Discontinued: 1/1/1994 Weight (lbs): 26 Dimensions (in): 8 H x 15 W x 18.3 D

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# LaserWriter Select 300: Technical Specifications

## LaserWriter Select 300

Logic Board	Ports	Power
Processor: none PD Language: QuickDraw	Ports: serial	Max Watts: 450 Amps: 3.75 BTU per Hr: 1539 Voltage: 110-115 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: none RAM Slots: 1 , 30-pin Min - Max RAM: 0.5MB - 4.5MB Min RAM Speed: 80 ns RAM Sizes: 1, 4MB	Pages Per Min: 5 Max DPI: 300 Min Life: 150,000	Introduced: 2/1/1993 Discontinued: 1/3/1995 Weight (lbs): 26 Dimensions (in): 8 H x 15 W x 18.3 D

Published Date: Jul 25, 2017

# Personal LaserWriter 320: Technical Specifications

## Personal LaserWriter 320

Logic Board	Ports	Power
Processor: AMD 29205, 16 MHz PD Language: PostScript Level 2	Ports: LocalTalk	Max Watts: 120 Amps: 1 BTU per Hr: 410.4 Voltage: 110-115 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 4MB RAM Slots: 1 , card Min - Max RAM: 2MB - 8MB Min RAM Speed: n/a RAM Sizes: 2, 6MB	Pages Per Min: 4 Max DPI: 300 Min Life: 100,000	Introduced: 10/1/1993 Discontinued: 9/16/1995 Weight (lbs): 15.4 Dimensions (in): 6.3 H x 15.2 W x 14.9 D

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# Personal LaserWriter 300:Technical Specifications

## Personal LaserWriter 300

Logic Board	Ports	Power
Processor: none	Ports: serial	Max Watts: 360
PD Language: QuickDraw		Amps: 3
		BTU per Hr: 1231.2
		Voltage: 100-115
		Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 4	Introduced: 6/1/1993
RAM Slots: 1 , n/a	Max DPI: 300	Discontinued: n/a
Min - Max RAM: 0.5MB - 0.5MB	Min Life: 100,000	Weight (lbs): 15.4
Min RAM Speed: n/a		Dimensions (in): 6.3 H x 15.2 W x 14.9 D
RAM Sizes: n/a		

Published Date: Jul 25, 2017

# Personal LaserWriter NTR: Technical Specifications

## Personal LaserWriter NTR

Logic Board	Ports	Power
Processor: AMD29005, 16 MHz PD Language: PostScript Level 2PCL 4+ 	Ports: LocalTalk RS-232/RS-422 serial Centronics parallel	Max Watts: 600 Amps: 5 BTU per Hr: 2052 Voltage: 110-115 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 2MB RAM Slots: 1 , 72-pin Min - Max RAM: 3MB - 4MB Min RAM Speed: 80 ns RAM Sizes: 1, 2MB	Pages Per Min: 4 Max DPI: 300 Min Life: 150,000	Introduced: 3/1/1992 Discontinued: 9/1/1993 Weight (lbs): 29.5 Dimensions (in): 8 H x 15 W x 18.3 D

Published Date: Jul 25, 2017



# Personal LaserWriter NT: Technical Specifications

## Personal LaserWriter NT

Logic Board	Ports	Power
Processor: 68000, 12 MHz PD Language: PostScriptDiablo 630HP LaserJet  	Ports: LocalTalk RS-232/RS-422 serial  	Max Watts: 600 Amps: 5 BTU per Hr: 2052 Voltage: 110-115 Freq Range: 50-60 Hz 
Memory	Engine	Physical
ROM Size: 1.25MB RAM Slots: 2 , 30-pin Min - Max RAM: 2MB - 8MB Min RAM Speed: 120 ns RAM Sizes: 1, 4MB	Pages Per Min: 4 Max DPI: 300 Min Life: 150,000  	Introduced: 7/1/1990 Discontinued: n/a Weight (lbs): 32 Dimensions (in): 8 H x 15 W x 18.3 D

Published Date: Jul 25, 2017

# iBook G4 (Mid 2005) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iBook G4 (Mid 2005) - Technical Specifications

Configurations	12-inch Combo Drive	14-inch SuperDrive
Model	M9846LL/A	M9848LL/A
Processor	1.33GHz PowerPC G4	1.42GHz PowerPC G4
Level 2 Cache	512K at 1.33GHz	512K at 1.42GHz
System bus	133MHz	142MHz
Memory (DDR SDRAM)	512MB PC2700 (333MHz) DDR SDRAM; supports up to 1.5GB; 1 available expansion slot	
Hard drive <sup>(2)</sup>	40GB ATA/100 4200 rpm	60GB ATA/100 4200 rpm
Optical drive	Slot-Load Combo Drive DVD-ROM/CD-RW	Slot-Load SuperDrive DVD±RW/CD-RW
Display	12.1-inch (diagonal) TFT XGA	14.1-inch (diagonal) TFT XGA
Graphics support	ATI Mobility Radeon 9550 with 32MB of dedicated DDR SDRAM	
FireWire	One FireWire 400 port at up to 400 Mbps	
USB	Two USB 2.0 ports at up to 480 Mbps each	
VGA, S-video and composite video output	Video mirroring supports VGA video out to an external display or projector (requires included Apple VGA Video Adapter) and S-video and composite video out to a TV or VCR (requires optional Apple Video Adapter, sold separately).	
Modem <sup>(3)</sup>	Built-in 56K V.92 modem	
Ethernet	Built-in 10/100BASE-T Ethernet	
Wireless <sup>(4)</sup>	Built-in 54-Mbps AirPort Extreme (Wi-Fi 802.11g); built-in Bluetooth 2.0+EDR	
System software	Mac OS X version 10.4 Tiger	
Software	iLife '06 (includes iTunes, iPhoto, iMovie HD, iDVD <sup>(5)</sup> , GarageBand, iWeb), Mail, Dashboard, Spotlight, iChat AV, Safari, Sherlock, QuickTime, iSync, iCal, DVD Player, Address Book, AppleWorks, iWork (30-day trial), Classic environment, Quicken 2005 for Macintosh, 2005 World Book Multimedia Reference Suite, Nanosaur 2, Marble Blast Gold, Microsoft Office 2004 for Mac Test Drive, Zinio Reader, XCode Developer Tools and Apple Hardware Test	
Service and support	90 days of free telephone support and one-year limited warranty. Product contains documentation. Backup copy of software is provided on CD-ROM.	
Hardware accessories	Apple VGA Display Adapter, modem cable, power adapter, AC wall plug, power cord, lithium-ion battery	

Build-to-Order Options	Order a custom-configured iBook from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Memory	256MB (768MB total), 512MB (1GB total), 1GB (1.5GB total)
Hard Drive <sup>(2)</sup>	60GB, 80GB or 100GB ATA-100 4200RPM
Wireless	AirPort Extreme Base Station (with modem and antenna port) M8799LL/A AirPort Express Base Station M9470LL/A
Adapters and cables	Apple Video Adapter M9109G/A Apple VGA Display Adapter M8639G/A Apple FireWire Cable (4-pin to 6-pin, 1.8 meter) M8706G/A
Battery and power	Apple Portable Power Adapter M8943LL/A iBook Rechargeable Battery (12.1-inch iBook with Combo drive) M9337G/A iBook Rechargeable Battery (14.1-inch iBook) M9338G/A
Accessories	Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269Z/A Apple Keyboard (White) M9034LL/A Apple Mouse (White) M9035G/A iSight M8817LL/C
Services	AppleCare Protection Plan M8852LL/A .Mac Subscription M9888Z/A

### Technical Specifications

#### Processor and memory

- 1.33GHz or 1.42GHz PowerPC G4 processor with Velocity Engine and 512K on-chip level 2 cache
- 133MHz or 142MHz system bus
- 512MB of PC2700 (333MHz) DDR SDRAM with support for up to 1.5GB

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## Storage

- 40GB or 60GB Ultra ATA hard disk drive <sup>(2)</sup>
- One of the following optical drives:
  - Combo Drive (DVD-ROM/CD-RW); writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads DVD-ROM discs at up to 8x speed, reads CD-ROM discs at up to 24x speed
  - 8x SuperDrive (DVD±RW/CD-RW); writes DVD±R discs at up to 8x speed, writes DVD±RW discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed.
- Support for external FireWire and USB storage devices

## Display

- Choice of built-in 12.1-inch or 14.1-inch (diagonal) TFT XGA active-matrix display
- Support for millions of colors at 1024 x 768 pixel resolution
- Support for resolution scaling to 800 x 600 pixel and 640 x 480 pixel resolution with millions of colors

## Graphics support

- ATI Mobility Radeon 9550 graphics processor with 32MB of dedicated video memory and AGP 4X support

## Communications

- Built-in 56K V.92 modem (RJ-11 connector) <sup>(3)</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in 54 Mbps AirPort Extreme (compliant with 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) <sup>(4)</sup>
- Built-in Bluetooth 2.0+EDR

## Peripheral connections

- Two 480 Mbps USB 2.0 ports
- One FireWire 400 port at up to 400 Mbps <sup>(6)</sup>

## Audio

- 16-bit CD-quality stereo headphone jack
- Built-in stereo speakers
- Built-in omnidirectional microphone
- Support for external USB audio devices such as microphones and speakers

## Video

- VGA video output for video mirroring on an external display or projector (24-bit color) with included Apple VGA Display Adapter.
- S-video and composite video output to TV or projector (requires Apple Video Adapter, sold separately)

## Battery

- iBook G4 with 12.1-inch display: 50-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge <sup>(7)</sup>
- iBook G4 with 14.1-inch display: 61-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge <sup>(7)</sup>
- Integrated charge indicator LEDs on battery

## Keyboard and trackpad

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement) and embedded numeric keypad
- Solid-state trackpad provides precise cursor control; supports tap, double-tap, drag and scrolling capabilities

## Electrical and environmental

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60 Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Size and weight (12.1-inch model)

- Height: 1.35 inches (3.42 cm)
- Width: 11.2 inches (28.5 cm)
- Depth: 9.06 inches (23.0 cm)
- Weight: 4.9 pounds (2.2 kg) <sup>(1)</sup>

## Size and weight: (14.1-inch model)

- Height: 1.35 inches (3.42 cm)
- Width: 12.7 inches (32.3 cm)
- Depth: 10.2 inches (25.9 cm)

# 43\_iBook G4 (Mid 2005) - Technical Specifications.pdf

- **Weight: 5.9 pounds (2.7 kg)** <sup>(1)</sup>

1. Weight varies by configuration and manufacturing process.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.
4. Wireless Internet access requires AirPort Base Station or AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.
5. You need an Apple SuperDrive to burn DVDs in iDVD, but you can save iDVD projects as an archive on iBook G4 models with a Combo Drive and later transfer them to a SuperDrive-equipped system and burn them to a DVD.
6. Actual rates will vary.
7. Battery life depends on configuration and use.

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

**Published Date: Apr 6, 2016**

# Personal LaserWriter LS:Technical Specifications

## Personal LaserWriter LS

Logic Board	Ports	Power
Processor: none	Ports: RS-422 serial	Max Watts: 600
PD Language: QuickDraw		Amps: 5
		BTU per Hr: 2052
		Voltage: 110-115
		Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 4	Introduced: 3/1/1991
RAM Slots: 4 , 30-pin	Max DPI: 300	Discontinued: 5/1/1993
Min - Max RAM: 0.5MB - 1MB	Min Life: 150,000	Weight (lbs): 31
Min RAM Speed: 100 ns		Dimensions (in): 8 H x 15 W x 18.3 D
RAM Sizes: .25MB		

Published Date: Jul 25, 2017

# Personal LaserWriter SC

This article has been archived and is no longer updated by Apple.

## Personal LaserWriter SC

Logic Board	Ports	Power
Processor: 68000, 7.275 MHz PD Language: QuickDraw	Ports: SCSI	Max Watts: 600 Amps: 5 BTU per Hr: 2052 Voltage: 110-115 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 16K RAM Slots: 4 , 30-pin Min - Max RAM: 1MB - 1MB Min RAM Speed: 120 ns RAM Sizes: .25MB	Pages Per Min: 4 Max DPI: 300 Min Life: 150,000	Introduced: 6/1/1990 Discontinued: 9/1/1993 Weight (lbs): 32 Dimensions (in): 8 H x 15 W x 18.3 D

Published Date: Apr 6, 2016

# ImageWriter: Technical Specifications

## ImageWriter

Logic Board	Ports	Power
Processor: none	Ports: serial	Max Watts: 180
PD Language: QuickDraw		Amps: 1.5
		BTU per Hr: 615.6
		Voltage: 120
		Freq Range: 60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: n/a	Introduced: 6/1/1984
RAM Slots: 1 , n/a	Max DPI: 144	Discontinued: 12/1/1985
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 19
Min RAM Speed: n/a		Dimensions (in): 4.8 H x 16.2 W x 11.8 D
RAM Sizes: n/a		

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Published Date: Jul 26, 2017

# ImageWriter (15''): Technical Specifications

## ImageWriter (15'')

Logic Board	Ports	Power
Processor: none	Ports: serial	Max Watts: 180
PD Language: QuickDraw		Amps: 1.5
		BTU per Hr: 615.6
		Voltage: 120
		Freq Range: 60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: n/a	Introduced: 4/1/1984
RAM Slots: 1 , n/a	Max DPI: 144	Discontinued: 9/1/1987
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 26.4
Min RAM Speed: n/a		Dimensions (in): 5.6 H x 22 W x 11.8 D
RAM Sizes: n/a		

Published Date: Jul 26, 2017



# ImageWriter II: Technical Specifications

## ImageWriter II

Logic Board	Ports	Power
Processor: none	Ports: serial opt'l. LocalTalk	Max Watts: 180
PD Language: QuickDraw		Amps: 1.5
		BTU per Hr: 615.6
		Voltage: 120
		Freq Range: 60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 2 draft0.5 best	Introduced: 9/1/1985
RAM Slots: 1 , n/a	Max DPI: 144	Discontinued: n/a
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 15
Min RAM Speed: n/a		Dimensions (in): 5 H x 17 W x 12 D
RAM Sizes: n/a		

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# Color LaserWriter 12/660 PS

## Color LaserWriter 12/660 PS

Logic Board	Ports	Power
Processor: AMD 29030, 30 MHz PD Language: PostScript Level 2  	Ports: LocalTalk Ethernet high-speed parallel	Max Watts: 1100 Amps: 9.2 BTU per Hr: 3762 Voltage: 100-120 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 8MB RAM Slots: 2 , 72-pin Min - Max RAM: 16MB - 40MB Min RAM Speed: 60 ns RAM Sizes: 1, 4, 16MB	Pages Per Min: 12 mono3 color Max DPI: 600 Min Life: 300,000 mono150,000 color	Introduced: 10/1/1996 Discontinued: n/a Weight (lbs): 110 Dimensions (in): 18 H x 21 W x 23 D

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# Color LaserWriter 12/600 PS: Technical Specifications

## Color LaserWriter 12/600 PS

Logic Board	Ports	Power
Processor: AMD 29030, 30 MHz PD Language: PostScript Level 2	Ports: LocalTalk Ethernet high-speed parallel	Max Watts: 1100 Amps: 9.2 BTU per Hr: 3762 Voltage: 100-120 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 8MB RAM Slots: 2, 72-pin Min - Max RAM: 12MB - 40MB Min RAM Speed: 60 ns RAM Sizes: 1, 4, 16MB	Pages Per Min: 12 mono3 color Max DPI: 600 Min Life: 300,000 mono150,000 color	Introduced: 6/1/1995 Discontinued: n/a Weight (lbs): 110 Dimensions (in): 18 H x 21 W x 23 D

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# ImageWriter LQ: Technical Specifications

## ImageWriter LQ

Logic Board	Ports	Power
Processor: none	Ports: serial opt'l. LocalTalk	Max Watts: 180
PD Language: QuickDraw		Amps: 1.5
		BTU per Hr: 615.6
		Voltage: 120
		Freq Range: 60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 0.3	Introduced: 8/1/1987
RAM Slots: 1 , n/a	Max DPI: 216	Discontinued: 12/1/1990
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 38
Min RAM Speed: n/a		Dimensions (in): 5.12 H x 23.2 W x 15 D
RAM Sizes: n/a		

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# Apple Color Printer: Technical Specifications

## Apple Color Printer

Logic Board	Ports	Power
Processor: none PD Language: QuickDraw	Ports: SCSI	Max Watts: 30 Amps: .25 BTU per Hr: 102.6 Voltage: 120 Freq Range: 60 Hz
Memory	Engine	Physical
ROM Size: none RAM Slots: 1 , n/a Min - Max RAM: none - none Min RAM Speed: n/a RAM Sizes: n/a	Pages Per Min: 0.5 mono0.29 color Max DPI: 360 Min Life: n/a	Introduced: 1/1/1993 Discontinued: 2/1/1994 Weight (lbs): 22 Dimensions (in): 6.7 H x 20.5 W x 16 D

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# Portable StyleWriter: Technical Specifications

## Portable StyleWriter

Logic Board	Ports	Power
Processor: none	Ports: Centronics parallel	Max Watts: 23
PD Language: QuickDraw		Amps: .19
		BTU per Hr: 78.66
		Voltage: 100-115
		Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 1.5	Introduced: 6/1/1993
RAM Slots: 1 , n/a	Max DPI: 360	Discontinued: 5/15/1995
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 4.5
Min RAM Speed: n/a		Dimensions (in): 1.9 H x 12.2 W x 8.7 D
RAM Sizes: n/a		

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# eMac (2005) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## eMac (2005) - Technical Specifications

Configurations	EDU [no optical]	EDU CD	Combo	Super
Model	M99832	M99833	M99834	M9835
Description	1.25G/256/40/none	1.25G/256/40/CD	1.42G/256/80/Combo	1.42G/512/160/Super
Processor/Speed	G4 / 1.25 Ghz		G4 / 1.42 Ghz	
- L2 Cache	512 KB (1:1)			
- L3 Cache	no			
Memory Included	256 MB			512 MB
Memory Maximum	1 GB			
Memory Slots	2			
Memory Form/Speed	SDRAM (184-pin) / PC2700 - DDR333			
Hard Drive Size	40 GB		80 GB	160 GB
Hard Drive Type/Speed	Ultra ATA/100 / 7200 RPM			
Optical Drive Type	none	CD-ROM (tray)	Combo Drive (tray)	SuperDrive (tray)
DVD Decoding	n/a		software	
DVD+R (dual layer)	n/a		4x read	6x read; 2.4x write
DVD±RW	n/a		8x read	8x read; 4x write
DVD±R	n/a		8x read	8x read; 8x write
DVD-ROM	n/a		12x read	
CD-RW	n/a		32x read; 24x write	32x read; 8x write
CD-R	n/a		32x read; 32x write	32x read; 24x write
CD-ROM	n/a	32x read		
USB 1.0	on keyboard (2)			
USB 2.0	3			
FireWire 400	2			
FireWire 800	no			
Expansion slots	none			
Ethernet (built-in)	100Base-T			
- Auto-MDIX	yes			
Modem, Internal (type)	no		v.92 (USB - HSP)	
AirPort	Extreme (optional)			
Bluetooth, Internal	1.1 (optional)			
Video Chipset	ATI Radeon 9200		ATI Radeon 9600	
- VRAM	32 MB DDR		63 MB DDR	
- video bus	AGP (4x)			
Display Size/Types	17" CRT (16" viewable)			
Display Native Resolution	1280 x 960			
External Connectors	mini-VGA (RGB Output)			
- Max Resolution (Analog)	1280 x 960			
S-video/Composite	yes (with optional Apple Video Adaptor)			
Dual Display Support	mirroring			
Microphone (Built-in)	yes (top of display, left side)			
Speaker, Internal	stereo			
Audio Line In	yes			
Audio Line Out	no			
Headphone	yes (side)			
Mac OS	10.4/Classic			

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Color	White
Size (Height/Width/Depth)	15.8" x 15.8" x 17.1" (40.6cm x 40.6cm x 43.3cm)
Weight	50 lbs. (22.7 kg)

Published Date: Apr 6, 2016



# Color StyleWriter 2200: Technical Specifications

## Color StyleWriter 2200

Logic Board	Ports	Power
Processor: none	Ports: serial	Max Watts: 31.5
PD Language: QuickDraw		Amps: 1
		BTU per Hr: 107.73
		Voltage: 120
		Freq Range: 60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 5 mono0.3 color	Introduced: 6/1/1995
RAM Slots: 1 , n/a	Max DPI: 720x360	Discontinued: n/a
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 3.1
Min RAM Speed: n/a		Dimensions (in): 2.2 H x 11.8 W x 6.2 D
RAM Sizes: n/a		

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# StyleWriter: Technical Specifications

This article has been archived and is no longer updated by Apple.

## StyleWriter

Logic Board	Ports	Power
Processor: none PD Language: QuickDraw <div></div>	Ports: serial	Max Watts: 23 Amps: .19 BTU per Hr: 78.66 Voltage: 110-120 Freq Range: 48-62 Hz
Memory	Engine	Physical
ROM Size: none RAM Slots: 1 , n/a Min - Max RAM: 64K - 64K Min RAM Speed: n/a RAM Sizes: n/a	Pages Per Min: 1 draft0.5 best Max DPI: 360 Min Life: n/a	Introduced: 3/1/1991 Discontinued: 1/1/1993 Weight (lbs): 7.5 Dimensions (in): 12.5 H x 13.25 W x 5.6 D

Published Date: Apr 6, 2016

# StyleWriter II: Technical Specifications

## StyleWriter II

Logic Board	Ports	Power
Processor: none	Ports: serial	Max Watts: 19.5
PD Language: QuickDraw		Amps: .16
		BTU per Hr: 66.69
		Voltage: 100-120
		Freq Range: 48-62 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 2 draft1 best	Introduced: 1/1/1993
RAM Slots: 1 , n/a	Max DPI: 360	Discontinued: 4/17/1995
Min - Max RAM: 128K - 128K	Min Life: n/a	Weight (lbs): 6.6
Min RAM Speed: n/a		Dimensions (in): 7 H x 13.6 W x 7.9 D
RAM Sizes: n/a		

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# iMac G5 (Ambient Light Sensor) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iMac G5 (Ambient Light Sensor) - Technical Specifications

Configurations	iMac G5 (ALS) [17" 1.8 GHz]	iMac G5 (ALS) [17" 2.0 GHz]	iMac G5 (ALS) [20" 2.0 GHz]
Order Number	M9843	M9844	M9845
Processor	1.8 GHz G5 (single)	2.0 GHz G5 (single)	
- L2 Cache	512 KB (1:1)		
- L3 Cache	no		
- Frontside Bus	600 MHz (3:1)		667 MHz (3:1)
Memory	512 MB		
- Maximum	2 GB		
- Slots	2 SDRAM (184-pin), PC3200 - DDR400		
Hard Drive	160 GB		250 GB
- Type/Speed	Serial ATA Speed, 7200 rpm		
Optical Drive	Combo Drive (slot)	SuperDrive (slot)	
- DVD Decoding	software		
- DVD+R (dual layer)	5x read	6x read; 2.4x write	
- DVD±RW	5x read	6x read; 4x write	
- DVD±R	6x read	6x read; 8x write	
- DVD-ROM	8x read		
- CD-RW	24x read; 8x write		
- CD-R	24x read; 24x write		
- CD-ROM	24x read		
USB 1.1	on keyboard (2)		
USB 2.0	3		
FireWire 400	2		
FireWire 800	no		
Expansion Slots	none		
EtherNet (built-in)	1000Base-T		
- Auto-MDIX	yes		
Modem	v.92 (USB - HSP)		
Wireless Networking	AirPort Extreme (built-in/non-removable), Bluetooth 2.0 + EDR (Internal)		
Display	17" LCD		20" LCD
- Max Resolution	1440x900		1680x1050
Video External Connectors	mini-VGA (RGB Output), S-video, (Composite with optional Apple Video Adapter)		
Audio Line Out	no		
Audio Line In	yes		
Headphones	yes (headphone/optical digital audio out port)		
Optical In/Out (S/PDIF>	yes (digital out, with optional TOSLink cable)		
Speakers (built-in)	stereo		
Microphone (built-in)	yes		
Accessories Included	Apple keyboard/mouse (or optional Apple Wireless Keyboard and Mouse)		
Software Included	OS 10.4 / Classic, Classic (non-bootable; not pre-installed), OS Install/OS Restore Install Disk 1 (dual-layer DVD), Install Disc 2 (DL-DVD) for iLife Assembly and Classic, Apple Hardware Test, iMac/eMac 2.5.1 (on Install Disk 1)		
Size (Height/Width/Depth)	16.9" x 16.8" x 6.8" (43.0cm x 42.6cm x 17.3cm)		18.6" x 19.4" x 7.4" (47.2cm x 49.3cm x 18.9cm)
Weight	18.5 lbs. (8.4 kg)		25.2 lbs. (11.4 kg)
Service and Support	90 days of free telephone support and one-year limited warranty		

# StyleWriter 1200: Technical Specifications

## StyleWriter 1200

Logic Board	Ports	Power
Processor: none	Ports: serial	Max Watts: 19.5
PD Language: QuickDraw		Amps: .16
		BTU per Hr: 66.69
		Voltage: 100-120
		Freq Range: 48-62 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 3 draft2 best	Introduced: 4/1/1995
RAM Slots: 1 , n/a	Max DPI: 720x360	Discontinued: n/a
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 6.6
Min RAM Speed: n/a		Dimensions (in): 7 H x 13.6 W x 7.9 D
RAM Sizes: n/a		

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# Color LaserWriter 12/600 PS: Technical Specifications

## Color LaserWriter 12/600 PS

Logic Board	Ports	Power
Processor: AMD 29030, 30 MHz PD Language: PostScript Level 2	Ports: LocalTalk Ethernet high-speed parallel	Max Watts: 1100 Amps: 9.2 BTU per Hr: 3762 Voltage: 100-120 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 8MB RAM Slots: 2 , 72-pin Min - Max RAM: 12MB - 40MB Min RAM Speed: 60 ns RAM Sizes: 1, 4, 16MB	Pages Per Min: 12 mono3 color Max DPI: 600 Min Life: 300,000 mono150,000 color	Introduced: 6/1/1995 Discontinued: n/a Weight (lbs): 110 Dimensions (in): 18 H x 21 W x 23 D

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# Color LaserWriter 12/660 PS: Technical Specifications

## Color LaserWriter 12/660 PS

Logic Board	Ports	Power
Processor: AMD 29030, 30 MHz PD Language: PostScript Level 2	Ports: LocalTalk Ethernet high-speed parallel	Max Watts: 1100 Amps: 9.2 BTU per Hr: 3762 Voltage: 100-120 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 8MB RAM Slots: 2 , 72-pin Min - Max RAM: 16MB - 40MB Min RAM Speed: 60 ns RAM Sizes: 1, 4, 16MB	Pages Per Min: 12 mono3 color Max DPI: 600 Min Life: 300,000 mono150,000 color	Introduced: 10/1/1996 Discontinued: n/a Weight (lbs): 110 Dimensions (in): 18 H x 21 W x 23 D

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# Color StyleWriter 1500: Technical Specifications

## Color StyleWriter 1500

Logic Board	Ports	Power
Processor: none PD Language: QuickDraw	Ports: serial opt'l. LocalTalk opt'l. EtherTalk	Max Watts: 22.6 Amps: 1 BTU per Hr: 77.292 Voltage: 100-120 Freq Range: 48-62 Hz
Memory	Engine	Physical
ROM Size: none RAM Slots: 1 , n/a Min - Max RAM: none - none Min RAM Speed: n/a RAM Sizes: n/a	Pages Per Min: 3 mono0.3 color Max DPI: 720x360 Min Life: n/a	Introduced: 2/19/1996 Discontinued: n/a Weight (lbs): 5.5 Dimensions (in): 6.9 H x 13.7 W x 8.5 D

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# Color StyleWriter Pro: Technical Specifications

## Color StyleWriter Pro

Logic Board	Ports	Power
Processor: none	Ports: serial	Max Watts: 28
PD Language: QuickDraw		Amps: .23
		BTU per Hr: 95.76
		Voltage: 90-132
		Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 2 mono0.5 color	Introduced: 2/1/1994
RAM Slots: 1 , n/a	Max DPI: 360	Discontinued: 12/16/1995
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 11
Min RAM Speed: n/a		Dimensions (in): 7.2 H x 16.5 W x 10.1 D
RAM Sizes: n/a		

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# Color StyleWriter 2400: Technical Specifications

## Color StyleWriter 2400

Logic Board	Ports	Power
Processor: none PD Language: QuickDraw	Ports: serial opt'l. LocalTalk	Max Watts: 45 Amps: .38 BTU per Hr: 153.9 Voltage: 100-120 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: none RAM Slots: 1 , n/a Min - Max RAM: none - none Min RAM Speed: n/a RAM Sizes: n/a	Pages Per Min: 3 mono0.3 color Max DPI: 360 Min Life: n/a	Introduced: 9/1/1994 Discontinued: n/a Weight (lbs): 7.9 Dimensions (in): 8.3 H x 14.4 W x 8.4 D

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# Color StyleWriter 2500: Technical Specifications

## Color StyleWriter 2500

Logic Board	Ports	Power
Processor: none	Ports: serial opt'l. LocalTalk opt'l. EtherTalk	Max Watts: 27.6
PD Language: QuickDraw		Amps: 1
		BTU per Hr: 94.392
		Voltage: 120
		Freq Range: 60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 5 mono0.66 color	Introduced: 2/19/1996
RAM Slots: 1 , n/a	Max DPI: 720x360	Discontinued: n/a
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 6.9
Min RAM Speed: n/a		Dimensions (in): 8.3 H x 14.4 W x 9.2 D
RAM Sizes: n/a		

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# Color StyleWriter 4100: Technical Specifications

## Color StyleWriter 4100

Logic Board	Ports	Power
Processor: none	Ports: LocalTalk High-speed serial (RS-422-A)	Max Watts: 12
PD Language: QuickDraw		Amps: 1
		BTU per Hr: 41.04
		Voltage: 108-132, 200-250
		Freq Range: 50, 60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 5 mono1.7 color	Introduced: 6/16/1997
RAM Slots: 1 , n/a	Max DPI: 600	Discontinued: n/a
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 11.7
Min RAM Speed: n/a		Dimensions (in): 7.8 H x 17.2 W x 15.9 D
RAM Sizes: n/a		

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# Power Mac G5 (Early 2005) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Power Mac G5 (Early 2005) - Technical Specifications

Configurations	Early 2005 Dual 2.0 GHz	Early 2005 Dual 2.3 GHz	Early 2005 Dual 2.70 GHz (with LCS Heatsink)
Model	M9747xx/A	M9748xx/A	M9749xx/A
Processor	Dual G5 2.0 GHz	Dual G5 2.3 GHz	Dual G5 2.7 GHz
- Front Side Bus	1 GHz / processor	1.15 GHz / processor	1.35 GHz / processor
- L2 Cache	512 KB (1:1)		
- L3	no		
Memory	512 MB		
- Maximum	4 GB	8 GB	
- Slots	4 (matched pairs)	8 (matched pairs)	
- Form	SDRAM (184-pin)		
- Speed	PC3200 - DDR400		
Hard Drive	160 GB	250 GB	
- Type	Serial ATA		
- Speed	7200 RPM		
- Max. Internal Drives	2		
Optical Drive	SuperDrive (tray)		
- DVD Decoding	software		
- DVD+R (dual layer)	6x read; 4x write		
- DVD-R (dual layer)	6x read;		
- DVD±RW	8x read; 8x write		
- DVD±R	16x read; 16x write		
- DVD-ROM	16x read		
- CD-RW	32x read; 24x write		
- CD-R	32x read; 24x write		
- CD-ROM	32x read		
USB 1.1	on keyboard (2)		
USB 2.0	3 (1 front, 2 rear)		
FireWire 400	2 (1 front, 1 rear)		
FireWire 800	1		
Expansion Slots	3 PCI slots (64-bit, 33 MHz)	3 PCI slots (Slots 2&3 64-bit, 100 MHz; Slot 4 64-bit, 133 MHz)	
EtherNet (built-in)	1000 Base-T		
- Auto MDIX	yes		
Modem, Internal (type)	optional v.92 (USB - HSP)		
Airport	Extreme (optional)		
Bluetooth, Internal	2.0 + EDR (optional)		
Video Card	ATI Radeon 9600		ATI Radeon 9650
- VRAM	128 MB DDR		256 MB GDDR3
- video bus	AGP (8x)		
Video Bus	32-bit, 66 MHz		
Video External Connectors	two single-link DVI		one single-link DVI, one dual-link DVI
- Max Resolution (Digital)	1920x1200		2560x1600
- Max Resolution (Analog)	1600 x 1200		
Dual-link DVI	no		yes
S-video/Composite	yes (with optional DVI to Video Adapter)		
Dual Display Support	mirroring and extended desktop		
Microphone (Built-in)	no		

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Speaker, Internal	mono		
Audio Line In	yes		
Audio Line Out	yes		
Headphone	yes (front)		
Optical In/Out (S/PDIF)	yes		
Pro Speakers	no		
Mac OS	10.4 / Classic		
Class Support	Classic (non-bootable; not pre-installed)		
Video Adaptors	DVI to VGA Adapter		
Size (Height/Width/Depth)	18.7" x 8.1" x 20.1" (47.5cm x 20.6cm x 51.1cm)		
Weight	44.4 lbs. (20.2 kg)		
Power Supply	450 W	450 W	600 W

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# Color StyleWriter 4500: Technical Specifications

## Color StyleWriter 4500

Logic Board	Ports	Power
Processor: none	Ports: LocalTalk High-speed serial (RS-422-A)	Max Watts: 12
PD Language: QuickDraw		Amps: 1
		BTU per Hr: 41.04
		Voltage: 108-132, 200-250
		Freq Range: 50, 60 Hz
Memory	Engine	Physical
ROM Size: none	Pages Per Min: 5 mono1.7 color	Introduced: 6/16/1997
RAM Slots: 1 , n/a	Max DPI: 600	Discontinued: n/a
Min - Max RAM: none - none	Min Life: n/a	Weight (lbs): 11.7
Min RAM Speed: n/a		Dimensions (in): 7.8 H x 17.2 W x 15.9 D
RAM Sizes: n/a		

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# Color StyleWriter 6500: Technical Specifications

## Color StyleWriter 6500

Logic Board	Ports	Power
Processor: none PD Language: QuickDraw	Ports: LocalTalk High Speed Serial (RS-422-A) IEEE 1284 bi-directional parallel opt'l. EtherTalk	Max Watts: 48 Amps: 1 BTU per Hr: 164.16 Voltage: 100-240 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: none RAM Slots: 1 , n/a Min - Max RAM: none - none Min RAM Speed: n/a RAM Sizes: n/a	Pages Per Min: 8 mono4 color Max DPI: 600 Min Life: n/a	Introduced: 6/16/1997 Discontinued: n/a Weight (lbs): 14.3 Dimensions (in): 6.9 H x 17.5 W x 15.6 D

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# LaserWriter: Technical Specifications

## LaserWriter

Logic Board	Ports	Power
Processor: 68000, 12 MHz PD Language: PostScriptDiablo 630	Ports: LocalTalk serial	Max Watts: 760 Amps: 6.3 BTU per Hr: 2599.2 Voltage: 115 Freq Range: 60 Hz
Memory	Engine	Physical
ROM Size: 0.5MB RAM Slots: 1 , n/a Min - Max RAM: 1.5MB - 1.5MB Min RAM Speed: n/a RAM Sizes: n/a	Pages Per Min: 8 Max DPI: 300 Min Life: 300,000	Introduced: 3/1/1985 Discontinued: 2/1/1988 Weight (lbs): 77 Dimensions (in): 11.5 H x 18.5 W x 16.2 D

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# LaserWriter Plus: Technical Specifications

## LaserWriter Plus

Logic Board	Ports	Power
Processor: 68000, 12 MHz PD Language: PostScriptDiablo 630	Ports: LocalTalk serial	Max Watts: 760 Amps: 6.3 BTU per Hr: 2599.2 Voltage: 115 Freq Range: 60 Hz
Memory	Engine	Physical
ROM Size: 1MB RAM Slots: 1 , n/a Min - Max RAM: 1.5MB - 1.5MB Min RAM Speed: n/a RAM Sizes: n/a	Pages Per Min: 8 Max DPI: 300 Min Life: 300,000	Introduced: 1/1/1986 Discontinued: 2/1/1988 Weight (lbs): 77 Dimensions (in): 11.5 H x 18.5 W x 16.2 D

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# LaserWriter IISC: Technical Specifications

## LaserWriter IISC

Logic Board	Ports	Power
Processor: 68000, 7.45 MHz PD Language: QuickDraw	Ports: SCSI	Max Watts: 900 Amps: 7.5 BTU per Hr: 3078 Voltage: 90-126 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 16K RAM Slots: 4 , n/a Min - Max RAM: 1MB - 1MB Min RAM Speed: 120 ns RAM Sizes: .25MB	Pages Per Min: 8 Max DPI: 300 Min Life: 300,000	Introduced: 1/1/1988 Discontinued: 7/1/1990 Weight (lbs): 45 Dimensions (in): 8.7 H x 20.2 W x 18.7 D

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# LaserWriter IINT: Technical Specifications

## LaserWriter IINT

Logic Board	Ports	Power
Processor: 68000, 11.5 MHz PD Language: PostScriptDiablo 630	Ports: LocalTalk RS-232/RS-422 serial	Max Watts: 900 Amps: 7.5 BTU per Hr: 3078 Voltage: 90-126 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 1MB RAM Slots: 1 , n/a Min - Max RAM: 2MB - 2MB Min RAM Speed: n/a RAM Sizes: n/a	Pages Per Min: 8 Max DPI: 300 Min Life: 300,000	Introduced: 1/1/1988 Discontinued: 10/1/1991 Weight (lbs): 45 Dimensions (in): 8.7 H x 20.2 W x 18.7 D

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# LaserWriter IINTX: Technical Specifications

## LaserWriter IINTX

Logic Board	Ports	Power
Processor: 68020, 16.67 MHz PD Language: PostScriptDiablo 630HP LaserJet	Ports: LocalTalk RS-232/RS-422 serial	Max Watts: 900 Amps: 7.5 BTU per Hr: 3078 Voltage: 90-126 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 1MB RAM Slots: 12 , 64-pin Min - Max RAM: 2MB - 12MB Min RAM Speed: 120 ns RAM Sizes: .25, 1MB	Pages Per Min: 8 Max DPI: 300 Min Life: 300,000	Introduced: 1/1/1988 Discontinued: 10/1/1991 Weight (lbs): 45 Dimensions (in): 8.7 H x 20.2 W x 18.7 D

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# LaserWriter IIf: Technical Specifications

## LaserWriter IIf

Logic Board	Ports	Power
Processor: 68030, 20 MHz PD Language: PostScript Level 2PCL 4+	Ports: LocalTalk RS-232/RS-422 serial	Max Watts: 900 Amps: 7.5 BTU per Hr: 3078 Voltage: 90-126 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 2MB RAM Slots: 8 , 30-pin Min - Max RAM: 2MB - 32MB Min RAM Speed: 80 ns RAM Sizes: .25, 1, 4MB	Pages Per Min: 8 Max DPI: 300 Min Life: 300,000	Introduced: 10/1/1991 Discontinued: 5/1/1993 Weight (lbs): 45 Dimensions (in): 8.7 H x 20.2 W x 18.7 D

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# LaserWriter IIg: Technical Specifications

## LaserWriter IIg

Logic Board	Ports	Power
Processor: 68030, 25 MHz PD Language: PostScript Level 2PCL 4+ 	Ports: LocalTalk Ethernet RS-232/RS-422 serial	Max Watts: 900 Amps: 7.5 BTU per Hr: 3078 Voltage: 90-126 Freq Range: 50-60 Hz
Memory	Engine	Physical
ROM Size: 2MB RAM Slots: 8 , 30-pin Min - Max RAM: 5MB - 32MB Min RAM Speed: 80 ns RAM Sizes: .25, 1, 4MB	Pages Per Min: 8 Max DPI: 300 Min Life: 300,000	Introduced: 10/1/1991 Discontinued: 10/1/1993 Weight (lbs): 45 Dimensions (in): 8.7 H x 20.2 W x 18.7 D

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# LaserWriter Pro 600: Technical Specifications

## LaserWriter Pro 600

Logic Board	Ports	Power
Processor: 68030, 25 MHz PD Language: PostScript Level 2PCL 4+ 	Ports: LocalTalk RS-232/RS-422 serial Centronics parallel	Max Watts: 560 Amps: 4.67 BTU per Hr: 1915.2 Voltage: 90-110 Freq Range: 58-62 Hz
Memory	Engine	Physical
ROM Size: 2MB RAM Slots: 2 , 72-pin Min - Max RAM: 8MB - 32MB Min RAM Speed: 80 ns RAM Sizes: 4, 8, 16MB	Pages Per Min: 8 Max DPI: 600 Min Life: 450,000	Introduced: 1/1/1993 Discontinued: 10/1/1993 Weight (lbs): 39 Dimensions (in): 12.1 H x 16.8 W x 16.9 D

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# iPod with color display 20 GB, 30 GB, and 60 GB - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iPod with color display 20 GB, 30 GB, and 60 GB - Technical Specifications

Configurations (Mac + PC)	20GB iPod	30GB iPod	60GB iPod
Model	MA079LL/A MA127LL/A (U2 Special Edition iPod with color display) MA215LL/A (Harry Potter Collector's iPod with color display)	M9829LL/A	M9830LL/A
Storage	20GB(1)	30GB(1)	60GB(1)
Battery life	Up to 15 hours audio playback time(3) Up to 5 slideshow playback time (without video out)(3)		
Skip protection	Up to 25 minutes		
Display	2-inch (diagonal) color LCD with LED backlight		
Ports	Dock connector, remote connector, stereo minijack		
Connectivity	FireWire 400 (optional cable) and USB 2.0 through dock connector		
Charge time	Up to 5 hours (up to 3-hour fast charge to 80% capacity)		
Audio support	AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible, AIFF, Apple Lossless and WAV		
Size	4.1 by 2.4 by 0.57 inches	4.1 by 2.4 by 0.63 inches	4.1 by 2.4 by 0.75 inches
Weight	5.6 ounces	5.9 ounces	6.4 ounces
Included software	iTunes for Mac, iTunes for Windows(4)		
Included accessories	Earbud headphones, iPod USB Power Adapter, Dock Connector to USB 2.0 cable		
Optional accessories	Dock; in-ear headphones; earbud headphones and remote; carrying case; AC adapter; Dock Connector to USB 2.0 cable; Dock Connector to FireWire cable; world travel adapter kit		
Mac requirements	Macintosh computer with FireWire port or built-in USB 2.0 port; Mac OS X v10.2.8 or later (for FireWire); USB 2.0 requires Mac OS X v10.3.4 or later		
Windows requirements	PC with FireWire or USB 2.0 port, or FireWire or USB 2.0 card; Windows 2000 (Service Pack 4 or later) or Windows XP Home or Professional (Service Pack 2 or later)		
Documentation and support	Electronic documentation and getting started guide.		
Limited warranty and service	Your iPod comes with single incident telephone support for the first 90 days and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> for iPod to extend your service and support to two full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.		

Options & Accessories	Available from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Cables and adapters	Dock Connector to FireWire Cable M9127G/A iPod Dock Connector to USB 2.0 Cable M9569G/A Apple iPod AV Cable (M9765G/A)
Docks & Kits	iPod photo Dock Kit (M9868G/A) Apple iPod Universal Dock (MA045G/A) iPod AV Connection Kit (MA242LL/A)
Headphones	Remote & Earbud Headphones M9128G/A In-Ear Headphones M9394G/A<
Cases	Carrying Case w/ Belt Clip
Services	AppleCare Protection Plan M9404LL/A

### Technical Specifications

# 47\_iPod with color display 20 GB, 30 GB, and 60 GB - Technical Specifications.pdf

### Capacity

- 20 GB, 30 GB, or 60 GB hard disk drive<sup>(1)</sup>
  - Holds 5,000, 7,500, or 15,000 songs in 128-Kbps AAC format<sup>(2)</sup>
  - Stores data via FireWire (optional cable) or USB 2.0<sup>(3)</sup> hard drive

### Size and weight (20 GB model including U2 Special Edition and Harry Potter Collector's iPod models)

- Height: 4.1 in
- Width: 2.4 in
- Depth: 0.63 in
- Weight: 5.9 oz (167 g)

### Size and weight (30 GB model)

- Height: 4.1 in
- Width: 2.4 in
- Depth: 0.63 in
- Weight: 5.9 oz (167 g)

### Size and weight (60 GB model)

- Height: 4.1 in
- Width: 2.4 in
- Depth: 0.75 in
- Weight: 6.4 oz (181 g)

### Display (20 GB, 30 GB, and 60 GB models)

- 2-inch (diagonal) color liquid crystal display with blue-white LED backlight
- 220-by-176-pixel resolution, 0.18-mm dot pitch
- 16-bit, 65,536 colors
- Support for display of multiple languages and characters simultaneously
- Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only) and PNG formats.

### Audio

- Up to 25 minutes of skip protection
- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible, AIFF, Apple Lossless and WAV
- Upgradable firmware enables support for future audio formats

### Customizable settings (iPod)

- Customize main menu
- Create multiple On-The-Go playlists
- Adjust audiobook playback speed
- Clicker playback through headphones
- Rate songs
- Shuffle songs or albums
- Repeat one or all
- Sound Check on or off
- 20 Equalizer settings
- Backlight timer
- Display contrast
- Alarms on, off or silent
- Sleep timer
- Date and time
- Display time in menu bar
- Contacts sort and display by first or last names
- Clicker on or off
- Menu Languages: English, French, German, Japanese, Spanish, Italian, Dutch, Danish, Norwegian, Finnish, Swedish, Korean, Simplified Chinese, Traditional Chinese.
- Display Song, Artist and Album Info in: Bulgarian, Croatian, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Slovenian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, Turkish and Ukrainian.

### Headphones

- Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

### Input and output

- Dock connector
- 3.5-mm stereo headphone jack
- Wired remote connector

### Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Non operating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

### Power and battery (3)

- Built-in rechargeable lithium ion battery
- iPod audio playback time: Up to 15 hours when fully charged
- iPod slideshow playback time: Up to 5 hours when fully charged (without TV out)
- Standby time: 1 month when fully charged
- Charging via FireWire to computer system or power adapter
  - Fast-charge time: Up to 3 hours for iPod (charges up to 80% of battery capacity)
  - Full-charge time: Up to 5 hours
- Charging via USB 2.0 to computer system or power adapter
  - Full-charge time: Up to 5 hours

### Power adapter

- iPod USB Power Adapter
- AC input: 100V to 240V at 0.4 amp maximum
- Frequency: 50Hz to 60Hz

1. 1GB = 1 billion bytes; actual formatted capacity less.  
2. Capacity based on 4 minutes per song and 128-Kbps AAC encoding.  
3. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.  
4. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

# LaserWriter Pro 630: Technical Specifications

## LaserWriter Pro 630

Logic Board	Ports	Power
Processor: 68030, 25 MHz PD Language: PostScript Level 2PCL 4+	Ports: LocalTalk Ethernet RS-232/RS-422 serial Centronics parallel	Max Watts: 560 Amps: 4.67 BTU per Hr: 1915.2 Voltage: 90-110 Freq Range: 58-62 Hz
Memory	Engine	Physical
ROM Size: 2MB RAM Slots: 2 , 72-pin Min - Max RAM: 8MB - 32MB Min RAM Speed: 80 ns RAM Sizes: 4, 8, 16MB	Pages Per Min: 8 Max DPI: 600 Min Life: 450,000	Introduced: 1/1/1993 Discontinued: 9/1/1994 Weight (lbs): 39 Dimensions (in): 12.1 H x 16.8 W x 16.9 D

Published Date: Jul 26, 2017

# LaserWriter Pro 810: Technical Specifications

## LaserWriter Pro 810

Logic Board	Ports	Power
Processor: Weitek 8200, 7.25 MHz PD Language: PostScript Level 2PCL 4+ 	Ports: LocalTalk RS-232/RS-422 serial Ethernet	Max Watts: 560 Amps: 4.6 BTU per Hr: 1915.2 Voltage: 90-126 Freq Range: 58-62 Hz
Memory	Engine	Physical
ROM Size: 3MB RAM Slots: 3 , module Min - Max RAM: 8MB - 32MB Min RAM Speed: n/a RAM Sizes: 4, 8MB	Pages Per Min: 20 Max DPI: 800 Min Life: 600,000	Introduced: 10/1/1993 Discontinued: 11/1/1994 Weight (lbs): 81 Dimensions (in): 19.5 H x 20.5 W x 21.5 D

Published Date: Jul 26, 2017

# LaserWriter 16/600 PS: Technical Specifications

## LaserWriter 16/600 PS

Logic Board	Ports	Power
Processor: AMD 29030, 25 MHz PD Language: PostScript Level 2PCL 5	Ports: LocalTalk Ethernet Centronics parallel	Max Watts: 790 Amps: 6.8 BTU per Hr: 2701.8 Voltage: 100-120 Freq Range: 58-62 Hz
Memory	Engine	Physical
ROM Size: 4MB RAM Slots: 2 , 72-pin Min - Max RAM: 8MB - 32MB Min RAM Speed: 80 ns RAM Sizes: 4, 8, 16MB	Pages Per Min: 17 Max DPI: 600 Min Life: 450,000	Introduced: 9/1/1994 Discontinued: n/a Weight (lbs): 40 Dimensions (in): 12.1 H x 16.7 W x 16.9 D

Published Date: Jul 26, 2017

# LaserWriter 8500: Technical Specifications

## LaserWriter 8500

Logic Board	Ports	Power
Processor: AMD 29040, 60/30 MHz PD Language: PostScript Level 3	Ports: LocalTalk Ethernet bidirectional parallel	Max Watts: 840 Amps: 6.3 BTU per Hr: 2872.8 Voltage: 90-132 Freq Range: 47-63 Hz
Memory	Engine	Physical
ROM Size: 8MB RAM Slots: 1 , n/a Min - Max RAM: 16MB - 48MB Min RAM Speed: 70 ns RAM Sizes: 16, 32MB	Pages Per Min: 20 Max DPI: 600 Min Life: n/a	Introduced: 8/5/1997 Discontinued: n/a Weight (lbs): 70.4 Dimensions (in): 16.2 H x 23.2 W x 17.9 D

Published Date: Jul 26, 2017

# iMac (Early 2008) - Technical Specifications

This article has been archived and is no longer updated by Apple.

	20-inch iMac(MB323LL/A)	20-inch iMac(MB324LL/A)	24-inch iMac(MB325LL/A)
Processor	2.4GHz Intel Core 2 Duo	2.66GHz Intel Core 2 Duo	2.8GHz Intel Core 2 Duo
L2 cache	6MB shared		
Frontside bus	1066MHz		
Memory	1GB (one 1GB SO-DIMM) of 800MHz DDR2 SDRAM; supports up to 4GB	2GB (two 1GB SO-DIMMs) of 800MHz DDR2 SDRAM; supports up to 4GB	
Hard drive	250GB Serial ATA <sup>4</sup> ; 7200 rpm	320GB Serial ATA <sup>4</sup> ; 7200 rpm	
Optical drive	Slot-loading 8x SuperDrive with 4x double-layer burning (DVD±R DL/DVD±RW/CD-RW)		
Display	20-inch (viewable) glossy widescreen TFT active-matrix LCD, 1680 by 1050 pixels, millions of colors		24-inch (viewable) glossy widescreen TFT active-matrix LCD, 1920 by 1200 pixels, millions of colors
Video	Built-in iSight camera; mini-DVI output port with support for DVI, VGA, S-video, and composite video connections via adapter <sup>3</sup>		
Graphics	ATI Radeon HD 2400 XT with 128MB of GDDR3 memory	ATI Radeon HD 2600 PRO with 256MB of GDDR3 memory	
FireWire	One FireWire 400 port and one FireWire 800 port; 7 watts each		
USB	Three USB 2.0 ports on computer; two USB 2.0 ports on keyboard		
Audio	Built-in stereo speakers with 24-watt digital amplifier, built-in microphone, optical digital audio output/headphone out, optical digital audio input/audio line in		
Ethernet	Built-in 10/100/1000BASE-T (Gigabit)		
Wireless	Built-in AirPort Extreme (802.11n) <sup>2</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)		
Hardware accessories	Apple Remote, Apple Keyboard, and Mighty Mouse		
Other	Built-in IR receiver		Built-in IR receiver, optional VESA mount adapter kit
Configure-to-order options	<ul style="list-style-type: none"><li>• 2GB Memory Upgrade (two 1GB)</li><li>• 4GB Memory Upgrade (two 2GB)</li><li>• 320GB or 500GB Hard Drive</li><li>• Apple Wireless Keyboard</li><li>• Wireless Mighty Mouse</li><li>• Apple USB Modem</li><li>• Software: iWork '08, Aperture, Logic Express, Final Cut Express</li></ul>	<ul style="list-style-type: none"><li>• 4GB Memory Upgrade (two 2GB)</li><li>• 500GB or 750GB Hard Drive</li><li>• Apple Wireless Keyboard</li><li>• Wireless Mighty Mouse</li><li>• Apple USB Modem</li><li>• Software: iWork '08, Aperture, Logic Express, Final Cut Express</li></ul>	<ul style="list-style-type: none"><li>• 3.06GHz Intel Core 2 Duo</li><li>• NVIDIA GeForce 8800 GS w/ 512MB GDDR3 Memory</li><li>• 4GB Memory Upgrade (two 2GB)</li><li>• 500GB, 750GB, or 1TB Hard Drive</li><li>• Apple Wireless Keyboard</li><li>• Wireless Mighty Mouse</li><li>• Apple USB Modem</li><li>• Software: iWork '08, Aperture, Logic Express, Final Cut Express</li></ul>
Limited warranty and service	Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.		
Apple and the global environment	Learn more about Apple's dedication to reducing the environmental impact of our products and process. The Apple Product Environmental Specification details the environmental attributes of our products.		
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.		

## Configurations

### Size and weight

#### 20-inch iMac

Height:

18.5 inches (46.9 cm)

# 485\_iMac (Early 2008) - Technical Specifications.pdf

Width:  
19.1 inches (48.5 cm)  
Depth:  
7.4 inches (18.9 cm)  
Weight:  
20 pounds (9.1 kg)<sup>1</sup>

## 24-inch iMac

Height:  
20.5 inches (52.0 cm)  
Width:  
22.4 inches (56.9 cm)  
Depth:  
8.1 inches (20.7 cm)  
Weight:  
25.4 pounds (11.5 kg)<sup>1</sup>

## Connections and expansion

- One FireWire 400 port and one FireWire 800 port; 7 watts each
- Total of five USB 2.0 ports: three ports on computer, two ports on keyboard

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n draft (specification); IEEE 802.11a/b/g compatible)
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Internal 24-watt digital amplifier
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone

## Installed software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand)

## Environmental status

- Majority of circuit board laminates are free of brominated flame retardants
- Majority of internal cables are PVC-free
- Meets ENERGY STAR requirements
- Received a Silver rating from EPEAT

## Display

- Built-in 20-inch (viewable) or 24-inch (viewable) glossy widescreen TFT active-matrix liquid crystal display
- Resolution
  - 20-inch models: 1680 by 1050 pixels
  - 24-inch model: 1920 by 1200 pixels
- Millions of colors at all resolutions
- Typical viewing angle
  - 20-inch models:  
160° horizontal  
160° vertical
  - 24-inch models:  
178° horizontal  
178° vertical
- Typical brightness: 290 cd/m<sup>2</sup> (20-inch models); 385 cd/m<sup>2</sup> (24-inch model)



# 485\_iMac (Early 2008) - Technical Specifications.pdf

- Typical contrast ratio: 800:1 (20-inch models); 750:1 (24-inch model)

## Graphics and video support

- 20-inch model with 2.4GHz processor
  - ATI Radeon HD 2400 XT graphics processor with 128MB of GDDR3 memory
- 20-inch model with 2.66GHz processor
  - ATI Radeon HD 2600 PRO graphics processor with 256MB of GDDR3 memory
- 24-inch model with 2.8GHz or 3.06GHz processor, one of the following:
  - ATI Radeon HD 2600 PRO graphics processor with 256MB of GDDR3 memory
  - NVIDIA GeForce 8800 GS graphics processor with 512MB of GDDR3 memory
- Mini-DVI output port with support for DVI, VGA, S-video, and composite video connections via adapter<sup>3</sup>
- Built-in iSight camera
- Support for external display in extended desktop mode
  - Digital resolutions up to 1920 by 1200 pixels
  - Analog resolutions up to 2048 by 1536 pixels
- Support for external display in video mirroring mode

## Processor and memory

- 2.4GHz, 2.66GHz, 2.8GHz, or 3.06GHz Intel Core 2 Duo processor
- 6MB shared L2 cache at full processor speed
- 1066MHz frontside bus
- 1GB (one 1GB SO-DIMM) or 2GB (two 1GB SO-DIMMs) of 800MHz DDR2 SDRAM; two SO-DIMM slots support up to 4GB

## Storage

### Hard drive<sup>4</sup>

- 20-inch model with 2.4GHz processor
  - 250GB Serial ATA 7200-rpm hard drive
  - Optional 320GB or 500GB Serial ATA 7200-rpm hard drive
- 20-inch model with 2.66GHz processor
  - 320GB Serial ATA 7200-rpm hard drive
  - Optional 500GB or 750GB Serial ATA 7200-rpm hard drive
- 24-inch model with 2.8GHz or 3.06GHz processor
  - 320GB Serial ATA 7200-rpm hard drive
  - Optional 500GB, 750GB, or 1TB Serial ATA 7200-rpm hard drive

### Optical drive

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
  - Writes DVD+R DL and DVD-R DL discs at up to 4x speed
  - Writes DVD-R and DVD+R discs at up to 8x speed
  - Writes DVD-RW discs at up to 6x speed and DVD+RW discs at up to 8x speed
  - Reads DVDs at up to 8x speed
  - Writes CD-R discs at up to 24x speed
  - Writes CD-RW discs at up to 16x speed
  - Reads CDs at up to 24x speed

## Electrical and operating requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 200W (20-inch models); 280W (24-inch model)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## What's in the box

- iMac
- Apple Keyboard
- Mighty Mouse

# 485\_iMac (Early 2008) - Technical Specifications.pdf

- Apple Remote
- Cleaning cloth
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

## Options

### Accessories

- Time Capsule (MB276LL/A)
- AirPort Express Base Station (MB321LL/A)
- AirPort Extreme Base Station (MB053LL/A)
- Apple Wireless Keyboard (MB167LL/A)
- Apple wireless Mighty Mouse (MB111LL/A)
- Apple 8x DVD-R Media Kit (M9472G/A)
- Apple Mini-DVI to DVI Adapter (M9321G/B)
- Apple Mini-DVI to VGA Adapter (M9320G/A)
- Apple Mini-DVI to Video Adapter (M9319G/A)
- Apple FireWire Cable (M8706G/A)
- AppleCare Protection Plan (MA520LL/A)
- iMac 24-inch VESA Mount Adapter (MB060G/A)

### Applications

- iWork (MA790Z/A)
- Aperture (MB284Z/A)
- Logic Express (MA806LL/A)
- Final Cut Express (MB278Z/A)
- .Mac Subscription (MA927Z/A)

1. Weight varies by configuration and manufacturing process.
2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
3. Adapters are sold separately.
4. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.

Published Date: Apr 6, 2016

# Apple Studio Display - Technical Specifications

Physical		Power		
Introduced:	5/7/1998	Max Watts: 35		
Discontinued:	n/a	Amps: 1		
Tube Size:	15"	BTU per Hr: 119.7		
Viewable Size:	15.1	Voltage: 100-120/220-240		
Tube Type:	LCD	Freq Range: 50-60 Hz		
Weight (lbs):	12.1			
Dimensions (in):	15 H x 15.7 W x 9.8 D			
Modes				
Mode	Resolution	Vert Rate	Horiz Rate	DPI
VESA VGA	640x480	59.5Hz	31.4689Khz	85
Mac VGA	640x480	66.7Hz	31.469kHz	
VESA VGA	640x480	72.8Hz	35kHz	
VESA VGA	640x480	75.0Hz	35.156kHz	
VGA Text	720x400	70.1Hz	37.500kHz	
VESA SVGA	800x600	56.3Hz	37.861kHz	
VESA SVGA	800x600	60.3Hz	37.879kHz	
VESA SVGA	800x600	72.2Hz	48.077kHz	
VESA SVGA	800x600	75.0Hz	48.363kHz	
Mac 16"	832x624	74.6Hz	48.875kHz	
VESA XGA	1024x768	60.0Hz	49.725kHz	
VESA XGA	1024x768	70.1Hz	56.476kHz	
Mac XGA	1024x768	74.9Hz	60.023kHz	
VESA XGA	1024x7681024x768	75.0Hz	60.241kHz	

Published Date: Jul 26, 2017

# Macintosh Performa 5270CD - Technical Specifications

Logic Board	Ports	Power
Processor: 603e, 100 PMMU: integrated FPU: integrated Data Path: 64, 40 L1 Cache: 32K L2 Cache: opt'l 2nd Processor: none Slots: LC, comm, TV, video in/out	USB: ADB: 1 Video: opt. DB-15 Floppy: none SCSI: DB-25 Geoports: Ethernet: none FireWire: Mic Type: PlainTalk AirPort Ready: Other Ports: Printer Modem Speaker ,Headphone ,Remote Control , Sound INPUT: impedance 100 kOhm; avg. line level 100 mV rms; avg. mic. level 70 mV Notes: rms, max. input level 1.8 V rms>	Max Watts: 125 Amps: 4 BTU per Hr: 427.5 Voltage: 110-240 Freq Range: 50-60 Hz Battery Type: 4.5V alkaline Soft Power: yes
Memory	Video Memory	
Logic Board: none RAM Slots: 2, 72-pin SIMM Min - Max RAM: 8 MB - 64 MB Min RAM Speed: 80 RAM Sizes: 4, 8, 16, 32 MB Install in Groups of: 1	Video Memory Resolution 1MB DRAM (built in)  512 x 384 n/a-bit  640 x 400 n/a-bit  640 x 480 16-bit  800 x 600 n/a-bit  832 x 624 n/a-bit  1024 x 768 n/a-bit  1152 x 870 n/a-bit  1280 x 1024 n/a-bit	
Physical	Software	Storage
Introduced: 4/15/1996 Discontinued: n/a Form Factor: PM 5200 Gestalt ID: 41 Weight (lbs): 45 Dimensions 17.5 H x 15.1 W x 16 D (in): Notes: This system is not sold in the U.S.	Addressing Modes: 32-bit Orig SSW: 7.5.3 Orig Enabler: none ROM ID: \$077D ROM Ver: n/a ROM Size: 4MB AppleTalk Ver: n/a Mac OS Supported: 7.5.3 7.5.5 7.6 7.6.1 8.0	Floppy Size: 1.44MB Floppy Inject: manual Min. Int HD Size: 1.2GB Int HD Interface: IDE Orig CD Speed: 4x Int CD Support: yes



# Macintosh Performa 578 - Technical Specifications

Logic Board	Ports	Power
Processor: 68LC040, 66	USB:	Max Watts: 40
PMMU: integrated	ADB: 1	Amps: .5
FPU: none	Video: none	BTU per Hr: 136.8
Data Path: 32, 33	Floppy: none	Voltage: 90-264
L1 Cache: 8K	SCSI: DB-25	Freq Range: 47-63 Hz
L2 Cache: none	Geoports:	Battery Type: 4.5V alkaline
2nd Processor: none	Ethemet: none	Soft Power: yes
Slots: 1 LC PDS, comm. slot	FireWire:	
	Mic Type: PlainTalk	
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,Headphone ,	
Memory	Video Memory	
Logic Board: 4 MB	Resolution	Video Memory 512K VRAM (2x256K ) Video Memory 1MB VRAM (2x512K)
RAM Slots: 1, 72-pin SIMM	512 x 384	n/a-bit n/a-bit
Min - Max RAM: 8 MB - 36 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 80	640 x 480	8-bit 16-bit
RAM Sizes: 1, 2, 4, 8, 16, 32 MB	800 x 600	n/a-bit n/a-bit
Install in Groups of: 1	832 x 624	n/a-bit n/a-bit
	1024 x 768	n/a-bit n/a-bit
	1152 x 870	n/a-bit n/a-bit
	1280 x 1024	n/a-bit n/a-bit
Physical	Software	Storage
Introduced: 2/1/1994	Addressing Modes: 24-, 32-bit	Floppy Size: 1.44MB
Discontinued: n/a	Orig SSW: 7.1P6	Floppy Inject: manual
Form Factor: LC 520	Orig Enabler: System Enabler 364	Min. Int HD Size: 320MB
Gestalt ID: 92	ROM ID: \$067C	Int HD Interface: SCSI
Weight (lbs): 40.5	ROM Ver: n/a	Orig CD Speed 2x
Dimensions (in): 17.9 H x 13.5 W x 16.5 D	ROM Size: 1MB	Int CD Support: yes
	AppleTalk Ver: 57.0.4	
	Mac OS 7.1P6	
	Supported: 7.5	
	7.5.1	
	7.5.3	
	7.5.5	
	7.6	
	7.6.1	
	8.0	

# PowerBook G4 (12-inch 1.5 GHz, 15-inch 1.67/1.5GHz, 17-inch 1.67 GHz) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (12-inch 1.5 GHz, 15-inch 1.67/1.5GHz, 17-inch 1.67 GHz) - Technical Specifications

Configurations	12-inch Combo drive	12-inch SuperDrive	15-inch Combo drive	15-inch SuperDrive	17-inch SuperDrive
Model	M9690LL/A	M9691LL/A	M9676LL/A	M9677LL/A	M9689LL/A
Processor	1.5GHz PowerPC G4			1.67GHz PowerPC G4	
Memory	512MB PC2700 (333MHz) DDR SDRAM		512MB PC2700 (333MHz) DDR SDRAM, single SO-DIMM		
Display	12.1-inch (diagonal), 1024 x 768 resolution, TFT		15.2-inch (diagonal), 1280 x 854 resolution, TFT widescreen		17-inch (diagonal), 1440 x 900 resolution, TFT widescreen
Graphics	NVIDIA GeForce FX Go5200 with 64MB of DDR SDRAM		ATI Mobility Radeon 9700 with 64MB of DDR SDRAM	ATI Mobility Radeon 9700 with 64MB of DDR SDRAM. Available with 128MB of DDR SDRAM and dual-link DVI as BTO option.	ATI Mobility Radeon 9700 with 128MB of DDR SDRAM and dual-link DVI
Hard disk drive <sup>(1)</sup>	60GB Ultra ATA/100; 5400 rpm	80GB Ultra ATA/100; 5400 rpm			100GB Ultra ATA/100; 5400 rpm
Slot-loading optical drive	Combo drive DVD-ROM/CD-RW	8x SuperDrive DVD±RW/CD-RW	Combo drive DVD-ROM/CD-RW	8x SuperDrive DVD±RW/CD-RW	
Ethernet	Built-in 10/100BASE-T		Built-in 10/100/1000BASE-T (Gigabit)		
Wireless <sup>(2)</sup>	Built-in 54-Mbps AirPort Extreme; built-in Bluetooth 2.0+EDR				
Modem <sup>(3)</sup>	Built-in 56K V.92 modem				
Keyboard	Full size		Full size, illuminated with ambient light sensor		
System software	Mac OS X v10.3 Panther				
Software	Mail, iChat, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie HD, GarageBand and iDVD <sup>(4)</sup> ), iSync, iCal, DVD Player, Classic environment, Art Directors Toolkit, EarthLink TotalAccess (includes 30 days of free dial-up service with Earthlink activation), FileMaker Pro Trial, GraphicConverter, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Microsoft Office 2004 for Mac Test Drive, Zinio Reader, Xcode Developer Tools and Apple Hardware Test				
Video accessories	Mini-DVI to DVI adapter, mini-DVI to VGA adapter		S-video to composite adapter, DVI to VGA adapter		
Hardware accessories	Modem cable, power adapter, AC wall plug, power cord				
Limited warranty and service	Your PowerBook G4 comes with 90 days of telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> and get three years of service and support. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.				
Internet access	All models also include 30 days of free Internet service through EarthLink. Internet access requires a compatible Internet service provider; fees may apply.				

Build-to-Order Options	Order a custom-configured PowerBook G4 from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Memory	512MB, 1GB SO-DIMMs
Hard drive	80GB or 100GB 5400-rpm drive options available on 15- and 17-inch models; 100GB option available for 12-inch model (only from the online Apple Store)
Wireless	AirPort Extreme Base Station (with modem and antenna port) M8799LL/A AirPort Express Base Station M9470LL/A
Battery and power	Apple Portable Power Adapter M8943LL/A PowerBook G4 12-inch Rechargeable Battery M9572G/A PowerBook G4 15-inch Rechargeable Battery M9325G/A PowerBook G4 17-inch Rechargeable Battery M9326G/A
Graphics	128MB DDR SDRAM graphics memory and dual-link DVI functionality option for 1.67GHz 15-inch model.
External keyboard and mouse	Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269ZM/A Apple Keyboard (White) M9034LL/A Apple Mouse (White) M9035G/A

# 48\_PowerBook G4 (12-inch 1.5 GHz, 15-inch 1.67-1.5GHz, 17-inch 1.67 GHz) - Technical Specifications

## Services

AppleCare Protection Plan M8853LL/A  
.Mac Subscription M9036Z/A

## Technical Specifications

### Processor and Memory

- 12-inch models
  - 1.5GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus
  - 512MB of PC2700 (333MHz) DDR SDRAM; one SO-DIMM slot; support for up to 1.25GB
- 15-inch models
  - 1.67GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus
  - 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB
- 17-inch model
  - 1.67GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus
  - 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB

### Storage <sup>(1)</sup>

- 60GB, 80GB or 100GB 5400-rpm Ultra ATA/100 hard drive with Sudden Motion Sensor (12-inch models)
- 80GB or 100GB 5400-rpm Ultra ATA/100 hard drive with Sudden Motion Sensor (15-inch models)
- 100GB 5400-rpm Ultra ATA/100 hard drive with Sudden Motion Sensor (17-inch model)
- One of the following slot-loading optical drives
  - Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed (12- and 15-inch models)
  - SuperDrive (DVD±RW/CD-RW): writes DVD-R discs at up to 8x ZCLV, writes DVD-RW at up to 4x ZCLV, writes DVD+R discs at up to 8x ZCLV, writes DVD+RW at up to 4x ZCLV, reads DVD-ROM at up to 8x, reads DVD-R at up to 6x, reads DVD+R at up to 6x, reads DVD-RW at up to 6x, reads DVD+RW at up to 6x, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 24x speed

### Communications

- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) <sup>(2)</sup>
- Built-in [Bluetooth 2.0+EDR](#) (Enhanced Data Rate)
- Built-in 10/100BASE-T Ethernet (RJ-45 connector) (12-inch models)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector) (15-inch and 17-inch models)
- Built-in 56K V.92 modem (RJ-11 connector) <sup>(3)</sup>

### Expansion

- One FireWire 400 (IEEE 1394a) port at up to 400 Mbps <sup>(5)</sup>
- One FireWire 800 (IEEE 1394b) port at up to 800 Mbps (15-inch and 17-inch models) <sup>(5)</sup>
- Two USB 2.0 ports at up to 480 Mbps
- One PC Card/CardBus slot supporting one Type I or Type II card (15-inch and 17-inch models)

### Display

- 12.1-inch (diagonal) TFT display (12-inch models)
  - Support for millions of colors at 1024 x 768 pixel resolution
  - Support for resolution scaling to 800 x 600 pixel and 640 x 480 pixel resolution with millions of colors
- 15.2-inch (diagonal) TFT display (15-inch models)
  - Support for millions of colors at 1280 x 854 pixel resolution
  - Support for resolutions of 1280 x 854 (native), 1152 x 768, 896 x 600, 720 x 480, and 640 x 480 pixels at 3:2 aspect ratio; 1024 x 768, 800 x 600 and 640 x 480 pixels at 4:3 aspect ratio
- 17-inch (diagonal) TFT display (17-inch model)
  - Support for millions of colors at 1440 x 900 pixel resolution
  - Supported resolutions: 1440 x 900 (native), 1152 x 720, 1024 x 768, 1024 x 640 and 800 x 600 pixels at 16:10 aspect ratio; 1024 x 768, 800 x 600 and 640 x 480 pixels at 4:3 aspect ratio

### Video and graphics support

- NVIDIA GeForce FX Go5200 graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory (12-inch models)
  - Dual display and video mirroring: Simultaneously supports up to 1024 x 768 pixels on the built-in display and up to 2048 x 1536 pixels on an external display, both at millions of colors <sup>(6)</sup>
- ATI Mobility Radeon 9700 graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory (15-inch model), 128MB of video memory (17-inch model)
  - Dual display and video mirroring: Simultaneously supports up to 1280 x 854 pixels on the built-in display and up to 2048 x 1536 pixels on an external display, both at millions of colors (15-inch model) <sup>(6)</sup>
  - Dual display and video mirroring: Simultaneously supports up to 1440 x 900 pixels on the built-in display and up to 2560 x 1600 pixels on an external display, both at millions of colors (17-inch model) <sup>(6)</sup>
- Mini-DVI port (12-inch models)
- DVI output using included mini-DVI to DVI adapter (12-inch models)
- VGA output using included mini-DVI to VGA adapter (12-inch models)
- S-video and composite video output using mini-DVI to video adapter (sold separately) (12-inch models)



# 48\_PowerBook G4 (12-inch 1.5 GHz, 15-inch 1.67-1.5GHz, 17-inch 1.67 GHz) - Technical Specifications

- DVI output port (15-inch and 17-inch models)
- VGA output using included DVI to VGA adapter (15-inch and 17-inch models)
- S-video output port (15-inch and 17-inch models)
- Composite video output using included S-video to composite adapter (15-inch and 17-inch models)

## Audio

- Audio line in (minijack) (12- and 15-inch models)
- Headphone out (minijack) (12- and 15-inch models)
- Combined optical digital input/audio line in (minijack) (17-inch model)
- Combined optical digital output/headphone out (minijack) (17-inch model)
- Built-in stereo speakers with midrange-enhancing third speaker (12-inch and 15-inch models)
- Two built-in stereo speakers (17-inch model)
- Internal omnidirectional microphone

## Battery and power

- 50-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 5 hours of battery life (12-inch models) <sup>(7)</sup>
- 50-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life (15-inch models) <sup>(7)</sup>
- 58-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life (17-inch model) <sup>(7)</sup>
- 45W power adapter with cable management system (12-inch models)
- 65W power adapter with cable management system (15-inch and 17-inch models)
- Power adapter port

## Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement) and embedded keypad
- Illuminated fiber-optic, backlit keyboard with ambient light sensor (15- and 17-inch models)
- Solid-state trackpad provides precise cursor control; supports tap, double-tap, drag and scrolling capabilities

## Security

- Kensington cable lock slot

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 ft
- Maximum storage altitude: 15,000 ft
- Maximum shipping altitude: 35,000 ft

## Size and weight (12-inch model)

- Height: 1.18 inches (3.0 cm)
- Width: 10.9 inches (27.7 cm)
- Depth: 8.6 inches (21.9 cm)
- Weight: 4.6 pounds (2.1 kg) with battery and optical drive installed <sup>(8)</sup>

## Size and weight (15-inch models)

- Height: 1.1 inches (2.8 cm)
- Width: 13.7 inches (34.8 cm)
- Depth: 9.5 inches (24.1 cm)
- Weight: 5.6 pounds (2.5 kg) with battery and optical drive installed <sup>(8)</sup>

## Size and weight (17-inch model)

- Height: 1.0 inch (2.6 cm)
- Width: 15.4 inches (39.2 cm)
- Depth: 10.2 inches (25.9 cm)
- Weight: 6.9 pounds (3.1 kg) with battery and optical drive installed <sup>(8)</sup>

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Wireless Internet access requires AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.

3. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.

4. Burning DVDs in iDVD requires an Apple SuperDrive, but iDVD projects can be saved as an archive on PowerBook G4 models with a Combo Drive and later transferred to a SuperDrive-equipped system and burned to a DVD.

5. Actual rates will vary.

6. Some third-party DVI displays may not support all resolutions. Actual resolutions and refresh rates depend on the monitor.

7. [Battery life](#) depends on configuration and use.

8. Actual weight varies by configuration and manufacturing process.

# 48\_PowerBook G4 (12-inch 1.5 GHz, 15-inch 1.67-1.5GHz, 17-inch 1.67 GHz) - Technical Spe

Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

## Power Macintosh 9500/150 - Technical Specifications

Logic Board		Ports		Power	
Processor:	604, 150	USB:		Max Watts:	225
PMMU:	integrated	ADB:	1	Amps:	9
FPU:	integrated	Video:	none	BTU per Hr:	769.5
Data Path:	64, 50	Floppy:	none		100-
L1 Cache:	32K	SCSI:	DB-25	Voltage:	125/200-240
L2 Cache:	512K	Geoports:	2	Freq Range:	50-60 Hz
2nd Processor:	opt. PC Compatibility Card	Ethernet:	AAUI, 10baseT	Battery Type:	3.6V lithium
Slots:	6 PCI	FireWire:		Soft Power:	yes
Notes:	One PCI slot occupied by video card.	Mic Type:	PlainTalk	Pass Through:	yes
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Resolution	Video Memory video card (2MB) (on-card)	Video Memory video card (4MB) (module)	
RAM Slots:	12, 168-pin DIMM	512 x 384	n/a-bit	n/a-bit	
Min - Max RAM:	8 MB - 768 MB	640 x 400	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 480	24-bit	24-bit	
RAM Sizes:	8, 16, 32, 64 MB	800 x 600	24-bit	24-bit	
Install in Groups of:	1	832 x 624	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
		Notes: Some systems ship with bundled video card.			
Physical		Software		Storage	

490\_Power Macintosh 9500-150 - Technical Specifications.pdf

Introduced:	4/22/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	8/3/1996	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PM 9500	Orig Enabler:	none	Min. Int HD Size:	none, 2GB
Gestalt ID:	67	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	28	ROM Ver:	\$28	Orig CD Speed	4x
Dimensions (in):	16.9 H x 7.7 W x 15.75 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.0		
		Mac OS Supported:	7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		
		Notes:	Maximum memory supported by System 7.5.3 is 1GB.		

Published Date: Jul 26, 2017

# Power Macintosh 9500/180MP - Technical Specifications

Logic Board	Ports	Power
Processor: two 604e, 180	USB:	Max Watts: 225
PMMU: integrated	ADB: 1	Amps: 9
FPU: integrated	Video: none	BTU per Hr: 769.5
Data Path: 64, 45	Floppy: none	100-
L1 Cache: 64K	SCSI: DB-25	Voltage: 125/200-240
L2 Cache: 512K	Geoports: 2	Freq Range: 50-60 Hz
2nd Processor: opt. PC Compatibility Card	Ethernet: AAUI, 10baseT	Battery Type: 3.6V lithium
Slots: 6 PCI	FireWire:	Soft Power: yes
Notes: Processor board contains two PowerPC 604e processors. One PCI slot occupied by video card.	Mic Type: PlainTalk	Pass Through: yes
	AirPort Ready:	
	Other Ports: Printer Modem Speaker ,	
Memory	Video Memory	
Logic Board: none	Resolution	Video Memory video card (2MB) (on-card) Video Memory video card (4MB) (module)
RAM Slots: 12, 168-pin DIMM	512 x 384	n/a-bit n/a-bit
Min - Max RAM: 32 MB - 768 MB	640 x 400	n/a-bit n/a-bit
Min RAM Speed: 70	640 x 480	24-bit 24-bit
RAM Sizes: 8, 16, 32, 64 MB	800 x 600	24-bit 24-bit
Install in Groups of: 1	832 x 624	24-bit 24-bit
Notes: 128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	1024 x 768	16-bit 24-bit
	1152 x 870	16-bit 24-bit
	1280 x 1024	8-bit 16-bit
	Notes: A video card ships bundled with this system.	
Physical	Software	Storage

491\_Power Macintosh 9500-180MP - Technical Specifications.pdf

Introduced:	8/5/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PM 9500	Orig Enabler:	none	Min. Int HD Size:	2GB
Gestalt ID:	67	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	28	ROM Ver:	\$28	Orig CD Speed	8x
Dimensions (in):	16.9 H x 7.7 W x 15.75 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.0		
		Mac OS Supported:	7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		
		Notes:	Maximum memory supported by System 7.5.3 is 1GB.		

Published Date: Jul 26, 2017

# Power Macintosh 9500/200 - Technical Specifications

Logic Board		Ports		Power	
Processor:	604e, 200	USB:		Max Watts:	225
PMMU:	integrated	ADB:	1	Amps:	9
FPU:	integrated	Video:	none	BTU per Hr:	769.5
Data Path:	64, 50	Floppy:	none		100-
L1 Cache:	64K	SCSI:	DB-25	Voltage:	125/200-240
L2 Cache:	512K	Geoports:	2	Freq Range:	50-60 Hz
2nd Processor:	opt. PC Compatibility Card	Ethernet:	AAUI, 10baseT	Battery Type:	3.6V lithium
Slots:	6 PCI	FireWire:		Soft Power:	yes
Notes:	One PCI slot occupied by video card.	Mic Type:	PlainTalk	Pass Through:	yes
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none		Video Memory	Video Memory	
RAM Slots:	12, 168-pin DIMM	Resolution	video card (2MB) (on-card)	video card (4MB) (module)	
Min - Max RAM:	16 MB - 768 MB	512 x 384	n/a-bit	n/a-bit	
Min RAM Speed:	70	640 x 400	n/a-bit	n/a-bit	
RAM Sizes:	8, 16, 32, 64 MB	640 x 480	24-bit	24-bit	
Install in Groups of:	1	800 x 600	24-bit	24-bit	
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	832 x 624	24-bit	24-bit	
		1024 x 768	16-bit	24-bit	
		1152 x 870	16-bit	24-bit	
		1280 x 1024	8-bit	16-bit	
		Notes: A video card ships bundled with this system.			
Physical		Software		Storage	

492\_Power Macintosh 9500-200 - Technical Specifications.pdf

Introduced:	8/5/1996	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	7.5.3	Floppy Inject:	manual
Form Factor:	PM 9500	Orig Enabler:	none	Min. Int HD Size:	2GB
Gestalt ID:	67	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	28	ROM Ver:	\$28	Orig CD Speed	8x
Dimensions (in):	16.9 H x 7.7 W x 15.75 D	ROM Size:	4MB	Int CD Support:	yes
		AppleTalk Ver:	60.1.0		
		Mac OS Supported:	7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		
		Notes:	Maximum memory supported by System 7.5.3 is 1GB.		

Published Date: Jul 26, 2017



# Power Macintosh 9515/132 - Technical Specifications

Logic Board		Ports		Power	
Processor:	604, 132	USB:		Max Watts:	225
PMMU:	integrated	ADB:	1	Amps:	9
FPU:	integrated	Video:	none	BTU per Hr:	769.5
Data Path:	64, 44	Floppy:	none	Voltage:	100-240
L1 Cache:	32K	SCSI:	DB-25	Freq Range:	50-60 Hz
L2 Cache:	512K	Geoports:	2	Battery Type:	3.6V lithium
2nd Processor:	opt. PC Compatibility Card	Ethernet:	AAUI, 10baseT	Soft Power:	yes
Slots:	6 PCI	FireWire:		Pass Through:	yes
		Mic Type:	PlainTalk		
		AirPort Ready:			
		Other Ports:	Printer Modem Speaker ,		
Memory		Video Memory			
Logic Board:	none	Video Memory requires video card (n/a)			
RAM Slots:	12, 168-pin DIMM	Resolution			
Min - Max RAM:	8 MB - 768 MB	512 x 384	n/a-bit		
Min RAM Speed:	70	640 x 400	n/a-bit		
RAM Sizes:	8, 16, 32, 64 MB	640 x 480	n/a-bit		
Install in Groups of:	1	800 x 600	n/a-bit		
Notes:	128MB DIMMs can be used, but have not been tested. Two identical DIMMs installed in corresponding slots may result in increased performance.	832 x 624	n/a-bit		
		1024 x 768	n/a-bit		
		1152 x 870	n/a-bit		
		1280 x 1024	n/a-bit		
Physical		Software		Storage	

493\_Power Macintosh 9515-132 - Technical Specifications.pdf

Introduced:	10/2/1995	Addressing Modes:	32-bit	Floppy Size:	1.44MB
Discontinued:	n/a	Orig SSW:	J-7.5.2	Floppy Inject:	manual
Form Factor:	PM 9500	Orig Enabler:	System Enabler 701 vJ-1.0	Min. Int HD Size:	none
Gestalt ID:	67	ROM ID:	\$077D	Int HD Interface:	SCSI
Weight (lbs):	28	ROM Ver:	\$28	Orig CD Speed:	4x
Dimensions (in):	16.9 H x 7.7 W x 15.75 D	ROM Size:	4MB	Int CD Support:	yes
Notes:	This system is not sold in the U.S.	AppleTalk Ver:	60.0.0		
		Mac OS Supported:	7.5.2 7.5.3 7.5.5 7.6 7.6.1 8.0 8.5 8.1 8.6 9		
		Notes:	Maximum memory supported by System 7.5.2 is 1GB.		

Published Date: Jul 26, 2017

# Studio Display (17" CRT, 16" VIS) - Technical Specifications

Physical		Power			
Introduced:	1/5/1999	Max Watts:	120		
Discontinued:	n/a	Amps:	2		
Tube Size:	17"	BTU per Hr:	410.4		
Viewable Size:	16" VIS	Voltage:	100-120/220-240		
Tube Type:		Freq Range:	50-60 Hz		
Weight (lbs):	48				
Dimensions (in):	18.9 H x 16.5 W x 16.9 D				
Modes					
	Mode	Resolution	Vert Rate	Horiz Rate	DPI
	Mac	640 x 480	66.7Hz	35.00kHz	
	Mac	832 x 624	75Hz	49.72kHz	
	Mac	1152 x 870	75Hz	68.68kHz	
	VESA	1024 x 768	60Hz	48.36kHz	
	VGA	640 x 480	60Hz	31.47kHz	
	VESA	800 x 600	60Hz	37.88kHz	
	VESA	800 x 600	85Hz	53.67kHz	
	VESA	1024 x 768	75Hz	60.02kHz	
	VESA	1280 x 1024	75Hz	79.98kHz	
	VESA	1600 x 1200	60Hz	75.00kHz	

Published Date: Jul 26, 2017

# iPhone 3G - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight<sup>1</sup>

Height:  
4.5 inches (115.5 mm)  
Width:  
2.4 inches (62.1 mm)  
Depth:  
0.48 inch (12.3 mm)  
Weight:  
4.7 ounces (133 grams)

## Color

- 8GB model: Black
- 16GB model: Black or white

## Capacity<sup>2</sup>

- 8GB or 16GB flash drive

## Cellular and wireless

- UMTS/HSDPA (850, 1900, 2100 MHz)
- GSM/EDGE (850, 900, 1800, 1900 MHz)
- Wi-Fi (802.11b/g)
- Bluetooth 2.0 + EDR

## GPS

- Assisted GPS

## In the box

- iPhone 3G
- Stereo Headset with mic
- Dock Connector to USB Cable
- USB Power Adapter
- Documentation
- Cleaning/polishing cloth
- SIM eject tool

## Environmental Status Report

iPhone 3G embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- PVC-free handset
- PVC-free headphones
- PVC-free USB cable
- Bromine-free printed circuit boards
- Mercury-free LCD display
- Majority of packaging made from post-consumer recycled fiberboard and biobased materials
- Power adapter outperforms strictest global energy efficiency standards

## Display

- 3.5-inch (diagonal) widescreen Multi-Touch display
- 480-by-320-pixel resolution at 163 ppi
- Support for display of multiple languages and characters simultaneously

## Audio

# 495\_iPhone 3G - Technical Specifications.pdf

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC, Protected AAC, MP3, MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## Headphones

- Stereo earphones with built-in microphone
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Video

- Video formats supported: H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

## Camera and photos

- 2.0 megapixels
- Photo geotagging
- iPhone and third-party application integration

## Language support

- Language support for English, French, German, Japanese, Dutch, Italian, Spanish, Portuguese, Danish, Finnish, Norwegian, Swedish, Korean, Simplified Chinese, Traditional Chinese, Russian, and Polish
- International keyboard and dictionary support for English (U.S.), English (UK), French (France), French (Canada), German, Japanese, Dutch, Italian, Spanish, Portuguese (Portugal), Portuguese (Brazil), Danish, Finnish, Norwegian, Swedish, Korean (no dictionary), Simplified Chinese, Traditional Chinese, Russian, and Polish

## Mail attachment support

- Viewable document types: .jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .vcf (contact information); .xls and .xlsx (Microsoft Excel)

## Connectors and input/output

- 30-pin dock connector
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Microphone
- SIM card tray

## External buttons and controls

- Sleep/wake
- Ring/silent
- Volume up/down
- Home

## Sensors

- Accelerometer
- Proximity sensor
- Ambient light sensor

## Power and battery

- Built-in rechargeable lithium-ion battery<sup>3</sup>
- Charging via USB to computer system or power adapter
- Talk time:<sup>4</sup>

# 495\_iPhone 3G - Technical Specifications.pdf

Up to 5 hours on 3G  
Up to 10 hours on 2G

- Standby time: Up to 300 hours<sup>5</sup>
- Internet use:  
Up to 5 hours on 3G<sup>6</sup>  
Up to 6 hours on Wi-Fi<sup>7</sup>
- Video playback: Up to 7 hours<sup>8</sup>
- Audio playback: Up to 24 hours<sup>9</sup>

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.10 or later
- iTunes 7.7 or later

## Windows system requirements

- PC with USB 2.0 port
- Windows Vista; or Windows XP Home or Professional with Service Pack 2 or later
- iTunes 7.7 or later

## Environmental requirements

- Operating temperature: 32° to 95° F  
(0° to 35° C)
- Nonoperating temperature: -4° to 113° F  
(-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## iPhone Accessories

### iPhone Bluetooth Headset

Answer iPhone calls wirelessly with this compact, lightweight Bluetooth headset. A single button lets you answer and end calls easily. And the lithium-ion battery delivers up to 5.5 hours of talk time and up to 72 hours of standby time.<sup>1</sup>

### iPhone 3G Dock

Get fast access to USB charging, syncing, and audio out with the iPhone 3G Dock. Even conduct speakerphone calls when your iPhone is in the dock.

### Apple USB Power Adapter

Charge your iPhone on the go with this new, ultracompact USB power adapter. Includes an Apple Dock Connector to USB Cable.

- iPhone Stereo Headset
- Apple Dock Connector to USB Cable
- iPhone Bluetooth Travel Cable
- iPhone 3G Universal Dock Adapter 3-Pack
- iPhone TTY Adapter
- Apple Universal Dock
- Apple Component AV Cable
- Apple Composite AV Cable
- AirPort Extreme Base Station

See more accessories in the Apple Online Store

1. Actual size and weight vary by configuration and manufacturing process.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

4. Talk time: Testing conducted by Apple in May and June 2008 using preproduction iPhone 3G units and software. iPhone 3G units were connected to a 1900MHz network or a 2100MHz network. All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks was turned off. Wi-Fi was enabled but not associated with a network. Battery life depends on the cellular network, location, signal strength, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.
5. Standby time: Testing conducted by Apple in May and June 2008 using preproduction iPhone 3G units and software. All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks was turned off. Wi-Fi was enabled but not associated with a network. Battery life depends on the cellular network, location, signal strength, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.
6. Internet use over 3G: Testing conducted by Apple in May and June 2008 using preproduction iPhone 3G units and software. Internet over 3G tests were conducted over a 1900MHz 3G network using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off. Wi-Fi was enabled but not associated with a network. Battery life depends on the cellular network, location, signal strength, 3G connectivity, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.
7. Internet use over Wi-Fi: Testing conducted by Apple in May and June 2008 using preproduction iPhone 3G units and software. Internet over Wi-Fi tests were conducted using a closed network and dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; WPA2 encryption was enabled. Battery life depends on the cellular network, location, signal strength, Wi-Fi connectivity, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.
8. Video playback: Testing conducted by Apple in May and June 2008 using preproduction iPhone 3G units and software. Video content consisted of a repeated 2-hour 23-minute movie purchased from the iTunes Store. All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off. Wi-Fi was enabled but not associated with a network. Battery life depends on the cellular network, location, signal strength, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.
9. Audio playback: Testing conducted by Apple in May and June 2008 using preproduction iPhone 3G units and software. The playlist consisted of 358 unique audio tracks, a combination of content imported from CDs using iTunes (128-Kbps AAC encoding) and content purchased from the iTunes Store (128-Kbps AAC encoding). All settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks was turned off. Wi-Fi was enabled but not associated with a network. Battery life depends on the cellular network, location, signal strength, feature configuration, usage, and many other factors. Battery tests are conducted using specific iPhone units; actual results may vary.
10. Talk and standby times: Testing conducted by Apple in June 2007 using preproduction iPhone Bluetooth Headsets, iPhone units, and software. All iPhone Bluetooth Headset settings were default. All iPhone settings were default except: Call Forwarding was turned on; the Wi-Fi feature Ask to Join Networks was turned off. Battery life depends on signal strength, usage, and many other factors. Battery tests are conducted using specific iPhone Bluetooth Headset and iPhone units; actual results may vary.

Published Date: Apr 6, 2016

# iPod touch (2nd generation) - Technical Specifications

## Size and weight

Height:  
4.3 inches (110 mm)  
Width:  
2.4 inches (61.8 mm)  
Depth:  
0.33 inch (8.5 mm)  
Weight:  
4.05 ounces (115 grams)<sup>1</sup>

## Capacity

- 8GB, 16GB, or 32GB flash drive<sup>2</sup>
- Holds up to 1,750, 3,500, or 7,000 songs in 128-Kbps AAC format<sup>3</sup>
- Holds up to 10,000, 20,000, or 25,000 iPod-viewable photos<sup>4</sup>
- Holds up to 10 hours, 20 hours, or 40 hours of video<sup>5</sup>

## Wireless<sup>6</sup>

- Wi-Fi (802.11b/g)
- Nike + iPod support built in
- Maps location-based service<sup>7</sup>

## In the box

- iPod touch
- Earphones
- USB 2.0 cable
- Dock adapter
- Polishing cloth
- Quick Start guide

## Environmental Status Report

iPod touch embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Arsenic-free glass
- Brominated flame retardant-free
- Mercury-free
- PVC-free
- Highly recyclable stainless steel enclosure

## Display

- 3.5-inch (diagonal) widescreen Multi-Touch display
- 480-by-320-pixel resolution at 163 pixels per inch

## Audio

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, AIFF, and WAV

## Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## TV and video



## 496\_iPod touch (2nd generation) - Technical Specifications.pdf

- Support for 480p and 576p component TV out
- H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

## Languages

- 17 languages supported: English, French, German, Japanese, Dutch, Italian, Spanish, Portuguese, Danish, Finnish, Norwegian, Swedish, Korean, Simplified Chinese, Traditional Chinese, Russian, Polish
- 30 international keyboards supported: English (US and UK), Czech, Danish, German, Spanish, Finnish, Estonian, French (France and Canada), Croatian, Hungarian, Icelandic, Italian, Japanese (QWERTY and Kana), Korean, Lithuanian, Latvian, Norwegian, Dutch, Polish, Portuguese (Brazil and Portugal), Romanian, Russian, Slovak, Swedish, Turkish, Simplified Chinese (Handwriting and Pinyin), Traditional Chinese (Handwriting and Pinyin)
- 19 dictionaries supported: English (US and UK), Danish, German, Spanish, Finnish, French (France and Canada), Italian, Japanese, Norwegian, Dutch, Polish, Portuguese (Brazil and Portugal), Russian, Swedish, Simplified Chinese, Traditional Chinese

## Input and output

- Dock connector
- 3.5-mm stereo headphone jack

## External buttons and controls

- Sleep/wake
- Volume up/down
- Home

## Battery and power<sup>8</sup>

- Built-in rechargeable lithium ion battery
- Playback time
  - Music playback time: Up to 36 hours when fully charged
  - Video playback time: Up to 6 hours when fully charged
- Charging via USB to computer system or power adapter (sold separately)
  - Fast-charge time: about 2 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 4 hours

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.10 or later
- iTunes 8 or later<sup>9</sup>

## Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 2 or later
- iTunes 8 or later<sup>9</sup>

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

### Comparison Chart

	iPod shuffle		iPod nano		iPod classic	iPod touch		
Storage	1GB	2GB	8GB	16GB	120GB	8GB	16GB	32GB

# 496\_iPod touch (2nd generation) - Technical Specifications.pdf

Songs	240	500	2,000	4,000	30,000	1,750	3,500	7,000
<b>Battery life</b>	Up to 12 hours of music playback		Up to 24 hours of music playback; up to 4 hours of video playback		Up to 36 hours of music playback; up to 6 hours of video playback	Up to 36 hours of music playback; up to 6 hours of video playback		
<b>Display</b>			2-inch (diagonal) color LCD with LED backlight		2.5-inch (diagonal) color LCD with LED backlight	3.5-inch (diagonal) widescreen Multi-Touch display		
<b>Ports</b>	Stereo minijack		Dock connector, stereo minijack		Dock connector, stereo minijack	Dock connector, stereo minijack		
<b>Connectivity</b>	USB through included dock		USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack		USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack	USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack		
<b>Wireless data</b>						Wi-Fi (802.11b/g) Nike + iPod support built in Maps location-based service		
<b>Charge time</b>	About 4 hours (2-hour fast charge to 80% capacity)		About 3 hours (1.5-hour fast charge to 80% capacity)		About 4 hours (2-hour fast charge to 80% capacity)	About 4 hours (2-hour fast charge to 80% capacity)		
<b>Audio support</b>	AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), WAV, and AIFF		AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF		AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF		
<b>Photo support</b>			Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats		Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats		
<b>Video support</b>			H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats		H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats	H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats		
<b>Size</b>	1.07 x 1.62 x 0.41 inches (27.3 x 41.2 x 10.5 mm) including clip		3.6 x 1.5 x 0.24 inches (90.7 x 38.7 x 6.2 mm)		4.1 x 2.4 x 0.41 inches (103.5 x 61.8 x 10.5 mm)	4.3 x 2.4 x 0.33 inches (110 x 61.8 x 8.5 mm)		
<b>Weight</b>	0.55 ounce (15.6 grams)		1.3 ounces (36.8 grams)		4.9 ounces (140 grams)	4.05 ounces (115 grams)		
<b>Included accessories</b>	Earphones, USB dock		Earphones, USB cable, dock adapter		Earphones, USB cable, dock adapter	Earphones, USB cable, dock adapter, polishing cloth		

# 496\_iPod touch (2nd generation) - Technical Specifications.pdf

## Accessories

### In-Ear Headphones with Remote and Mic

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing.

### USB Power Adapter

Use this ultracompact USB-based adapter to charge your iPhone or iPod whenever it's not connected to a computer.

### Earphones with Remote and Mic

These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.

### Universal Dock with Remote

Get easy access to a USB port for charging and syncing your iPod or for connecting to a TV or speakers.

- Apple iPod Radio Remote
- Apple Composite AV Cable
- Apple Component AV Cable
- Apple Dock Connector to USB Cable
- iPod Universal Dock Adapter 3-Pack

See more accessories in the Apple Online Store

1. Weight varies by configuration and manufacturing process.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Music capacity is based on 4 minutes per song and 128-Kbps AAC encoding; actual capacity varies by content.
4. Photo capacity is based on iPod-viewable photos transferred from iTunes.
5. Video capacity is based on H.264 1.5-Mbps video at 640-by-480 resolution combined with 128-Kbps audio; actual capacity varies by content.
6. Internet access required; broadband recommended; fees may apply.
7. For iPod touch with Maps, the Maps application provides your approximate location using information based on your proximity to known Wi-Fi networks (when on and available). The more accurate the available information, the smaller the circle identifying your position on the map. The feature is not available in all areas. Known Wi-Fi networks are predominantly in urban areas. In order to provide your location, data is collected in a form that does not personally identify you. If you do not want such data collected, do not enable the feature. Not enabling the feature will not impact the functionality of your iPod touch.
8. Testing conducted by Apple in August 2008 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (128-Kbps AAC); video content was purchased from the iTunes Store. iPod units were associated to a Wi-Fi network and Auto-Brightness was turned off; all other settings were default. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
9. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Jul 25, 2017

# iPod nano (4th generation) - Technical Specifications

## Size and weight

Height:  
3.6 inches (90.7 mm)  
Width:  
1.5 inches (38.7 mm)  
Depth:  
0.24 inch (6.2 mm)  
Weight:  
1.3 ounces (36.8 grams)<sup>1</sup>

## Capacity

- 8GB or 16GB flash drive<sup>2</sup>
- Holds up to 2,000 or 4,000 songs in 128-Kbps AAC format<sup>3</sup>
- Holds up to 7,000 or 14,000 iPod-viewable photos<sup>4</sup>
- Holds up to 8 hours or 16 hours of video<sup>5</sup>
- Stores data via USB flash drive

## Accessibility

- Spoken menus allow listeners to hear many of the names of menus, song titles, and artists without viewing the screen.
- An alternative large font can make menus easier to read.
- A high-resolution LCD display with adjustable contrast and backlight settings makes it easier to read in low light.
- Captions in video are displayed when they are present using a legible, high-contrast white-on-black font.

## Environmental Status Report

iPod nano embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Arsenic-free glass
- Brominated flame retardant-free
- Mercury-free
- PVC-free
- Highly recyclable aluminum enclosure

## Display

- 2-inch (diagonal) liquid crystal display with blue-white LED backlight
- 320-by-240-pixel resolution at 204 pixels per inch

## Audio

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Video

- H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

Languages

- Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, and Turkish
- Additional language support for display of song, album, and artist information: Bulgarian, Croatian, Romanian, Serbian, Slovak, Slovenian, Thai, Ukrainian, and Vietnamese

In the box

- iPod nano
- Earphones
- USB 2.0 cable
- Dock adapter
- Quick Start guide

Input and output

- Dock connector
- 3.5-mm stereo headphone jack

External buttons and controls

- Hold switch
- Click Wheel

Battery and power<sup>6</sup>

- Built-in rechargeable lithium ion battery
- Playback time
  - Music playback time: Up to 24 hours when fully charged
  - Video playback time: Up to 4 hours when fully charged
- Charging via USB to computer system or power adapter (sold separately)
  - Fast-charge time: about 1.5 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 3 hours

Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.11 or later
- iTunes 8 or later<sup>7</sup>

Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 3
- iTunes 8 or later<sup>7</sup>

Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

Comparison Chart

	iPod shuffle		iPod nano		iPod classic	iPod touch		
Storage	1GB	2GB	8GB	16GB	120GB	8GB	16GB	32GB
Songs	240	500	2,000	4,000	30,000	1,750	3,500	7,000
Battery life	Up to 12 hours of music playback		Up to 24 hours of music playback; up to 4 hours of video playback		Up to 36 hours of music playback; up to 6 hours of video playback	Up to 36 hours of music playback; up to 6 hours of video playback		

## 497\_iPod nano (4th generation) - Technical Specifications.pdf

<b>Display</b>		2-inch (diagonal) color LCD with LED backlight	2.5-inch (diagonal) color LCD with LED backlight	3.5-inch (diagonal) widescreen Multi-Touch display
<b>Ports</b>	Stereo minijack	Dock connector, stereo minijack	Dock connector, stereo minijack	Dock connector, stereo minijack
<b>Connectivity</b>	USB through included dock	USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack	USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack	USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack
<b>Wireless data</b>				Wi-Fi (802.11b/g) Nike + iPod support built in Maps location-based service
<b>Charge time</b>	About 4 hours (2-hour fast charge to 80% capacity)	About 3 hours (1.5-hour fast charge to 80% capacity)	About 4 hours (2-hour fast charge to 80% capacity)	About 4 hours (2-hour fast charge to 80% capacity)
<b>Audio support</b>	AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), WAV, and AIFF	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF
<b>Photo support</b>		Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats
<b>Video support</b>		H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats	H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats	H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
<b>Size</b>	1.07 x 1.62 x 0.41 inches (27.3 x 41.2 x 10.5 mm) including clip	3.6 x 1.5 x 0.24 inches (90.7 x 38.7 x 6.2 mm)	4.1 x 2.4 x 0.41 inches (103.5 x 61.8 x 10.5 mm)	4.3 x 2.4 x 0.33 inches (110 x 61.8 x 8.5 mm)
<b>Weight</b>	0.55 ounce (15.6 grams)	1.3 ounces (36.8 grams)	4.9 ounces (140 grams)	4.05 ounces (115 grams)
<b>Included accessories</b>	Earphones, USB dock	Earphones, USB cable, dock adapter	Earphones, USB cable, dock adapter	Earphones, USB cable, dock adapter, polishing cloth

### Accessories

#### In-Ear Headphones with Remote and Mic

# 497\_iPod nano (4th generation) - Technical Specifications.pdf

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing.

## USB Power Adapter

Use this ultracompact USB-based adapter to charge your iPhone or iPod whenever it's not connected to a computer.

## Earphones with Remote and Mic

These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.

## Universal Dock with Remote

Get easy access to a USB port for charging and syncing your iPod or for connecting to a TV or speakers.

- Apple iPod Radio Remote
- Apple Composite AV Cable
- Apple Component AV Cable
- Apple Dock Connector to USB Cable
- iPod Universal Dock Adapter 3-Pack

See more accessories in the Apple Online Store

1. Weight varies by configuration and manufacturing process.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Music capacity is based on 4 minutes per song and 128-Kbps AAC encoding; actual capacity varies by content.
4. Photo capacity is based on iPod-viewable photos transferred from iTunes.
5. Video capacity is based on H.264 1.5-Mbps video at 640-by-480 resolution combined with 128-Kbps audio; actual capacity varies by content.
6. Testing conducted by Apple in August 2008 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (128-Kbps AAC). Video content was purchased from the iTunes Store. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
7. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Jul 25, 2017

# iPod classic (120GB) - Technical Specifications

## Size and weight

Height:  
4.1 inches (103.5 mm)  
Width:  
2.4 inches (61.8 mm)  
Depth:  
0.41 inch (10.5 mm)  
Weight:  
4.9 ounces (140 grams)<sup>1</sup>

## Capacity

- 120GB hard drive<sup>2</sup>
- Holds up to 30,000 songs in 128-Kbps AAC format<sup>3</sup>
- Holds up to 25,000 iPod-viewable photos<sup>4</sup>
- Holds up to 150 hours of video<sup>5</sup>
- Stores data via USB hard drive

## In the box

- iPod classic
- Earphones
- USB 2.0 cable
- Dock adapter
- Quick Start guide

## Environmental Status Report

iPod classic embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Arsenic-free glass
- Brominated flame retardant-free
- Mercury-free
- PVC-free
- Highly recyclable aluminum and stainless steel enclosure
- Recycled and bio-based packaging materials

## Display

- 2.5-inch (diagonal) color LCD with LED backlight
- 320-by-240-pixel resolution at 163 pixels per inch

## Audio

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Video

- H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up



## 498\_iPod classic (120GB) - Technical Specifications.pdf

to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

## Languages

- Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, and Turkish
- Additional language support for display of song, album, and artist information: Bulgarian, Croatian, Romanian, Serbian, Slovak, Slovenian, Ukrainian, and Vietnamese

## Input and output

- Dock connector
- 3.5-mm stereo headphone jack

## External buttons and controls

- Hold switch
- Click Wheel

## Battery and power<sup>6</sup>

- Built-in rechargeable lithium ion battery
- Playback time
  - Music playback time: Up to 36 hours when fully charged
  - Video playback time: Up to 6 hours when fully charged
- Charging via USB to computer system or power adapter (sold separately)
  - Fast-charge time: about 2 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 4 hours

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.11 or later
- iTunes 8 or later<sup>7</sup>

## Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 3 or later
- iTunes 8 or later<sup>7</sup>

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

### Comparison Chart

	iPod shuffle		iPod nano		iPod classic	iPod touch		
Storage	1GB	2GB	8GB	16GB	120GB	8GB	16GB	32GB
Songs	240	500	2,000	4,000	30,000	1,750	3,500	7,000
Battery life	Up to 12 hours of music playback		Up to 24 hours of music playback; up to 4 hours of video playback		Up to 36 hours of music playback; up to 6 hours of video playback	Up to 36 hours of music playback; up to 6 hours of video playback		
Display			2-inch (diagonal) color LCD with LED backlight		2.5-inch (diagonal) color LCD with LED backlight	3.5-inch (diagonal) widescreen Multi-Touch display		
Ports	Stereo minijack		Dock connector, stereo minijack		Dock connector, stereo minijack	Dock connector, stereo minijack		

# 498\_iPod classic (120GB) - Technical Specifications.pdf

<b>Connectivity</b>	USB through included dock	USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack	USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack	USB through dock connector; component and composite video through dock connector (with AV cables, sold separately); audio through headphone jack
<b>Wireless data</b>				Wi-Fi (802.11b/g) Nike + iPod support built in Maps location-based service
<b>Charge time</b>	About 4 hours (2-hour fast charge to 80% capacity)	About 3 hours (1.5-hour fast charge to 80% capacity)	About 4 hours (2-hour fast charge to 80% capacity)	About 4 hours (2-hour fast charge to 80% capacity)
<b>Audio support</b>	AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), WAV, and AIFF	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF	AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, WAV, and AIFF
<b>Photo support</b>		Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats	Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only), and PNG formats
<b>Video support</b>		H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats	H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats	H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
<b>Size</b>	1.07 x 1.62 x 0.41 inches (27.3 x 41.2 x 10.5 mm) including clip	3.6 x 1.5 x 0.24 inches (90.7 x 38.7 x 6.2 mm)	4.1 x 2.4 x 0.41 inches (103.5 x 61.8 x 10.5 mm)	4.3 x 2.4 x 0.33 inches (110 x 61.8 x 8.5 mm)
<b>Weight</b>	0.55 ounce (15.6 grams)	1.3 ounces (36.8 grams)	4.9 ounces (140 grams)	4.05 ounces (115 grams)
<b>Included accessories</b>	Earphones, USB dock	Earphones, USB cable, dock adapter	Earphones, USB cable, dock adapter	Earphones, USB cable, dock adapter, polishing cloth

## Accessories

### In-Ear Headphones with Remote and Mic

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing.

### USB Power Adapter

# 498\_iPod classic (120GB) - Technical Specifications.pdf

Use this ultracompact USB-based adapter to charge your iPhone or iPod whenever it's not connected to a computer.

## Earphones with Remote and Mic

These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.

## Universal Dock with Remote

Get easy access to a USB port for charging and syncing your iPod or for connecting to a TV or speakers.

- Apple iPod Radio Remote
- Apple Composite AV Cable
- Apple Component AV Cable
- Apple Dock Connector to USB Cable
- iPod Universal Dock Adapter 3-Pack

See more accessories in the Apple Online Store

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6. Testing conducted by Apple in August 2008 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (128-Kbps AAC). Video content was purchased from the iTunes Store. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
7. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Jul 25, 2017

# MacBook Pro (15-inch, Late 2008) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:

0.95 inch (2.41 cm)

Width:

14.35 inches (36.4 cm)

Depth:

9.82 inches (24.9 cm)

Weight:

5.5 pounds (2.49 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- One FireWire 800 port (up to 800 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)
- Mini DisplayPort
- Audio line in
- Audio line out
- ExpressCard/34 slot
- Kensington lock slot

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone (located under left speaker grille)
- Combined optical digital input/analog line in (minijack)
- Combined optical digital output/analog line out (minijack)
- Supports Apple Stereo Headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free glass
- BFR-free internal components
- PVC-free internal cables
- Meets ENERGY STAR requirements
- EPEAT Gold rating

## Display

- 15.4-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

- NVIDIA GeForce 9600M GT graphics processor with dual-link DVI support; 256MB of GDDR3 memory on 2.4GHz configuration; 512MB of GDDR3 memory on 2.53GHz and 2.8GHz configurations

# 499\_MacBook Pro (15-inch, Late 2008) - Technical Specifications.pdf

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- Built-in iSight camera
- Mini DisplayPort

## Video output options

**DVI output** using Mini DisplayPort to DVI Adapter (optional)

**VGA output** using Mini DisplayPort to VGA Adapter (optional)

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter (optional)

## Input

- Built-in full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports two-finger scrolling, pinch, rotate, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.4GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache running 1:1 with processor speed; or 2.53GHz or 2.8GHz Intel Core 2 Duo processor with 6MB shared L2 cache
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) or 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 4GB

## Storage

- 250GB or 320GB 5400-rpm Serial ATA hard drive<sup>4</sup>
- Optional 250GB or 320GB 7200-rpm hard drive<sup>4</sup>
- Optional 128GB solid-state drive<sup>4</sup>

## Optical drive

- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)

Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW

Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>5</sup>

- 50-watt-hour lithium-polymer battery
- 85W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

# 499\_MacBook Pro (15-inch, Late 2008) - Technical Specifications.pdf

- MacBook Pro
- Display cleaning cloth
- 85W MagSafe Power Adapter, AC wall plug, and power cord

- Lithium-polymer battery
- Install/restore DVDs
- Printed and electronic documentation

## Installed software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand)

## Configurations

	2.4GHz MacBook Pro (MB470LL/A)	2.53GHz MacBook Pro (MB471LL/A)
Enclosure	Precision aluminum unibody	
Processor	2.4GHz Intel Core 2 Duo	2.53GHz Intel Core 2 Duo
L2 cache	3MB shared	6MB shared
System bus	1066MHz	
Memory	2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 4GB	4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 4GB
Hard drive <sup>4</sup>	250GB Serial ATA; 5400 rpm	320GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
Graphics	NVIDIA GeForce 9600M GT graphics processor; and NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>	
Graphics memory	256MB GDDR3	512MB GDDR3
Video	Built-in iSight camera; Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI (requires adapters, sold separately)	
Display	15.4-inch (diagonal) LED-backlit glossy widescreen display, 1440-by-900 resolution	
USB	Two USB 2.0 ports (up to 480 Mbps)	
Audio	Built-in stereo speakers, built-in omnidirectional microphone, combined optical digital input/analog line in, combined optical digital output/analog line out	
Networking	Built-in 10/100/1000BASE-T (Gigabit) Ethernet	
Wireless	Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification) <sup>2</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate) module	
Hardware accessories	85W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery	
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
Apple and the global environment	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 500GB or 1TB server-grade hard drive
- Wi-Fi Certified for 802.11n draft 2.0

# 499\_MacBook Pro (15-inch, Late 2008) - Technical Specifications.pdf

- USB port for connecting a USB printer or USB external hard drive

## Configure to order

- 250GB (7200-rpm) hard drive
- 320GB (5400-rpm) hard drive
- 320GB (7200-rpm) hard drive
- 128GB solid-state drive
- Up to 4GB of 1066MHz DDR3 SDRAM
- Apple Remote (MA128G/B)
- Apple USB Modem (MA034Z/A)
- Apple Mini DisplayPort to DVI Adapter (MB570)
- Apple Mini DisplayPort to Dual-Link DVI Adapter (MB571)
- Apple Mini DisplayPort to VGA Adapter (MB572)
- MagSafe Airline Adapter (MB441Z/A)
- AppleCare Protection Plan (MB588LL/A)
- Aperture 2 (MB673Z/A)
- Final Cut Express (MB278Z/A)
- Logic Express (MA806LL/A)
- iWork '08 (MB624Z/A)

## Accessories

- Apple LED Cinema Display (MB382LL/A)
- AirPort Extreme Base Station (MB053LL/A)
- AirPort Express Base Station (MB321LL/A)
- Apple Wireless Keyboard (MB167LL/A)
- Apple wireless Mighty Mouse (MB111LL/A)
- Apple Keyboard (MB110LL/A)
- Apple wired Mighty Mouse (MB112LL/A)
- Rechargeable Battery for MacBook Pro (MB772)

1. Actual weight varies by configuration and manufacturing process.
2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB. An additional 16MB is required when using an external display.
4. 1GB=1 billion bytes; actual formatted capacity less.
5. Testing conducted by Apple in October 2008 using preproduction 2.4GHz Intel Core 2 Duo–based MacBook Pro units with a Better Battery Life setting. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Apr 6, 2016

# MacBook Pro (Early 2008 and Late 2008) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

### 15-inch MacBook Pro

Height: 1.0 inch (2.59 cm)  
Width: 14.1 inches (35.7 cm)  
Depth: 9.6 inches (24.3 cm)  
Weight: 5.4 pounds (2.45 kg)<sup>1</sup>

### 17-inch MacBook Pro

Height: 1.0 inch (2.59 cm)  
Width: 15.4 inches (39.2 cm)  
Depth: 10.4 inches (26.5 cm)  
Weight: 6.8 pounds (3.08 kg)<sup>1</sup>

## Connections and expansion

- One FireWire 400 port at up to 400 Mbps
- One FireWire 800 port at up to 800 Mbps
- **15-inch MacBook Pro:** Two 480-Mbps USB 2.0 ports
- **17-inch MacBook Pro:** Three 480-Mbps USB 2.0 ports
- ExpressCard/34 slot
- Kensington cable lock slot

## Communications

Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible

Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)

Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone (located under left speaker grille)
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/audio line out (minijack)

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Backlit keyboard with ambient light sensor for automatic adjustment of keyboard illumination and screen brightness
- Solid-state trackpad with Multi-Touch gesture support for precise cursor control; supports two-finger scrolling, pinch, rotate, swipe, tap, double-tap, and drag capabilities

## Environmental status

- Majority of circuit board laminates are free of brominated flame retardants
- Majority of internal cables are PVC-free
- Meets ENERGY STAR requirements
- MacBook Pro received a Silver rating from EPEAT

## Display

### 15-inch MacBook Pro



## 4\_MacBook Pro (Early 2008 and Late 2008) - Technical Specifications.pdf

15.4-inch (diagonal) antiglare widescreen TFT LED backlit display with support for millions of colors; optional glossy widescreen display

**Supported resolutions:** 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

### 17-inch MacBook Pro

17-inch (diagonal) antiglare widescreen TFT display with support for millions of colors; optional glossy widescreen display

**Supported resolutions:** 1680 by 1050 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio stretched; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

Optional 17-inch (diagonal) antiglare TFT widescreen LED backlit display with support for millions of colors; optional glossy widescreen display

**Supported resolutions:** 1920 by 1200 (native), 1680 by 1050, 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio stretched; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

### 15-inch MacBook Pro

NVIDIA GeForce 8600M GT graphics processor with dual-link DVI support; 256MB of GDDR3 memory on 2.4GHz configuration; 512MB of GDDR3 memory on 2.5GHz and 2.6GHz configurations

### 17-inch MacBook Pro

NVIDIA GeForce 8600M GT graphics processor with dual-link DVI support and 512MB of GDDR3 memory

- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- DVI output port
- VGA output using included DVI to VGA adapter
- Built-in iSight camera

## Processor and memory

### 15-inch MacBook Pro

2.4GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache running 1:1 with processor speed; or 2.5GHz or 2.6GHz Intel Core 2 Duo processor with 6MB L2 cache

### 17-inch MacBook Pro

2.5GHz or 2.6GHz Intel Core 2 Duo processor with 6MB on-chip shared L2 cache running 1:1 with processor speed

- 2GB (two 1GB SO-DIMMs) of PC2-5300 (667MHz) DDR2 memory; two SO-DIMM slots support up to 4GB
- 800MHz frontside bus

## Storage

### 15-inch MacBook Pro

- 200GB or 250GB 5400-rpm Serial ATA hard drive; optional 200GB 7200-rpm drive<sup>3</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)

Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW

Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer),

# 4\_MacBook Pro (Early 2008 and Late 2008) - Technical Specifications.pdf

DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## 17-inch MacBook Pro

- 250GB 5400-rpm Serial ATA hard drive; optional 200GB 7200-rpm drive<sup>3</sup>; optional 300GB 4200-rpm
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)

Maximum write: 8x DVD-R, DVD+R, DVD+RW; 6x DVD-RW; 4x DVD-R DL (double layer), DVD+R DL (double layer); 24x CD-R; 16x CD-RW

Maximum read: 8x DVD-R, DVD+R, DVD+RW, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW; 24x CD

## Battery and power<sup>4</sup>

### 15-inch MacBook Pro

60-watt-hour lithium-polymer battery

### 17-inch MacBook Pro

68-watt-hour lithium-polymer battery

- 85W MagSafe Power Adapter with cable management system
- MagSafe power adapter port

\* Up to 5 hours when configured with optional 1920 x 1200 LED backlit display

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- DC input: 18.5 Vdc, 4.6A maximum
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Installed software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand)

## What’s in the box

- MacBook Pro
- Display cleaning cloth
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Lithium-polymer battery
- DVI to VGA adapter
- Install/restore DVDs
- Printed and electronic documentation

## Configurations

	15.4-inch: 2.4GHz (MB133LL/A)	15.4-inch: 2.5GHz (MB134LL/A)	17-inch: 2.5GHz (MB166LL/A)
Display	15.4-inch (diagonal), 1440 by 900 resolution, TFT widescreen		17-inch (diagonal), 1680 by 1050 resolution, TFT widescreen
Processor	2.4GHz Intel Core 2 Duo	2.5GHz Intel Core 2 Duo	

## 4\_MacBook Pro (Early 2008 and Late 2008) - Technical Specifications.pdf

<b>Memory</b>	2GB (two SO-DIMMs) 667MHz DDR2 memory (PC2-5300)	
<b>PCI Express graphics</b>	NVIDIA GeForce 8600M GT with 256MB of GDDR3 memory and dual-link DVI	NVIDIA GeForce 8600M GT with 512MB of GDDR3 SDRAM and dual-link DVI
<b>Hard disk drive<sup>3</sup></b>	200GB Serial ATA; 5400 rpm	250GB Serial ATA; 5400 rpm
<b>Slot-loading optical drive</b>	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
<b>Expansion</b>	One FireWire 400, one FireWire 800, two USB 2.0 ports, and ExpressCard/34 slot	One FireWire 400, one FireWire 800, three USB 2.0 ports, and ExpressCard/34 slot
<b>Video</b>	Built-in iSight camera, DVI, VGA (DVI to VGA adapter included)	
<b>Audio</b>	Combined optical digital input/audio line in, combined optical digital output/audio line out, stereo speakers, microphone	
<b>Ethernet</b>	Built-in 10/100/1000BASE-T (Gigabit)	
<b>Wireless<sup>2</sup></b>	Built-in AirPort Extreme (802.11n); built-in Bluetooth 2.1 + EDR	
<b>Modem</b>	Apple USB Modem (sold separately)	
<b>Input</b>	Full-size, illuminated keyboard with ambient light sensor; Multi-Touch trackpad	
<b>Weight<sup>1</sup></b>	5.4 pounds	6.8 pounds
<b>Footprint</b>	14.1 by 9.6 inches	15.4 by 10.4 inches
<b>Thickness</b>	1.0 inch	
<b>Video accessories</b>	DVI to VGA adapter (other adapters sold separately)	
<b>Hardware accessories</b>	85W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery	
<b>Limited warranty and service</b>	Your MacBook Pro comes with 90 days of telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
<b>Apple and the global environment</b>	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
<b>Recycling</b>	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Options

### Configure to order

- 15-inch: 250GB (5400 rpm) hard drive or 200GB (7200 rpm) hard drive
- 17-inch: 300GB (4200 rpm) hard drive or 200GB (7200 rpm) hard drive
- Up to 4GB of 667MHz DDR2 SDRAM
- Apple Remote
- Apple USB Modem
- Apple Mini-DVI to DVI Adapter
- Apple Mini-DVI to VGA Adapter
- Aperture 2
- Final Cut Express
- Logic Express
- iWork '08

### Accessories

- AirPort Extreme Base Station
- AirPort Express Base Station
- MagSafe Airline Adapter
- Apple Mini-DVI to Video Adapter
- AppleCare Protection Plan
- .Mac Subscription
- Apple Wireless Keyboard
- Apple wireless Mighty Mouse

## 4\_MacBook Pro (Early 2008 and Late 2008) - Technical Specifications.pdf

- Apple Keyboard
  - Apple wired Mighty Mouse
- 

1. Actual weight varies by configuration and manufacturing process.
2. Wireless Internet access requires a base station or other wireless access point and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.
3. 1GB=1 billion bytes. Actual formatted capacity less.
4. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Apr 6, 2016

# MacBook (13-inch, Aluminum, Late 2008) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:

0.95 inch (2.41 cm)

Width:

12.78 inches (32.5 cm)

Depth:

8.94 inches (22.7 cm)

Weight:

4.5 pounds (2.04 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- Two USB 2.0 ports (up to 480 Mbps)
- Mini DisplayPort
- Audio line in
- Audio line out
- Kensington lock slot

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone
- Combined optical digital input/analog line in (minijack)
- Combined optical digital output/analog line out (minijack)
- Supports Apple Stereo Headset with microphone

## Environmental Status Report

MacBook is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free glass
- BFR-free internal components
- PVC-free internal cables
- Meets ENERGY STAR requirements
- EPEAT Gold rating

## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>
- Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors

# 500\_MacBook (13-inch, Aluminum, Late 2008) - Technical Specifications.pdf

- Built-in iSight camera
- Mini DisplayPort

## Video output options

**DVI output** using Mini DisplayPort to DVI Adapter

**VGA output** using Mini DisplayPort to VGA Adapter

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter

## Input

- Multi-Touch trackpad for precise cursor control; supports two-finger scrolling, pinch, rotate, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## 2.0GHz MacBook

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)

## 2.4GHz MacBook

- Built-in full-size illuminated keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)

## Processor and memory

- 2.0GHz or 2.4GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 4GB

## Storage

### 2.0GHz MacBook

- 160GB 5400-rpm Serial ATA hard disk drive<sup>4</sup>
- Optional 250GB or 320GB 5400-rpm hard drive or 128GB solid-state drive<sup>4</sup>

### 2.4GHz MacBook

- 250GB 5400-rpm Serial ATA hard disk drive<sup>4</sup>
- Optional 320GB 5400-rpm hard drive or 128GB solid-state drive<sup>4</sup>

## Optical drive

- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)

Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW

Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, and DVD+RW; 24x CD

## Battery and power<sup>5</sup>

- 45-watt-hour lithium-polymer battery
- 60W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)

# 500\_MacBook (13-inch, Aluminum, Late 2008) - Technical Specifications.pdf

- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

- MacBook
- Display cleaning cloth
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Lithium-polymer battery
- Install/restore DVDs
- Printed and electronic documentation

## Installed software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand)

## Configurations

	2.0GHz MacBook (MB466LL/A)	2.4GHz MacBook (MB467LL/A)
Enclosure	Precision aluminum unibody	
Processor	2.0GHz Intel Core 2 Duo	2.4GHz Intel Core 2 Duo
L2 cache	3MB shared	
System bus	1066MHz	
Memory	2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM (PC3-8500); supports up to 4GB	
Hard drive <sup>4</sup>	160GB Serial ATA; 5400 rpm	250GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
Graphics	NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>	
Video	Built-in iSight camera; Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI (requires adapters, sold separately)	
Display	13.3-inch (diagonal) LED-backlit glossy widescreen display, 1280-by-800 resolution	
USB	Two USB 2.0 ports (up to 480 Mbps)	
Audio	Built-in stereo speakers, built-in omnidirectional microphone, combined optical digital input/analog line in, combined optical digital output/analog line out	
Networking	Built-in 10/100/1000BASE-T (Gigabit) Ethernet	
Wireless	Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification) <sup>2</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate) module	
Hardware accessories	60W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery	
Limited warranty and service	Your MacBook comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
Apple and the global environment	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Options

### Time Capsule

# 500\_MacBook (13-inch, Aluminum, Late 2008) - Technical Specifications.pdf

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 500GB or 1TB server-grade hard drive
- Wi-Fi Certified for 802.11n draft 2.0
- USB port for connecting a USB printer or USB external hard drive

## Configure to order

- 160GB (5400-rpm) hard drive
- 250GB (5400-rpm) hard drive
- 320GB (5400-rpm) hard drive
- 128GB solid-state drive
- Up to 4GB of 1066MHz DDR3 SDRAM
- Apple Remote (MA128G/B)
- Apple USB Modem (MA034Z/A)
- Apple Mini DisplayPort to DVI Adapter (MB570)
- Apple Mini DisplayPort to Dual-Link DVI Adapter (MB571)
- Apple Mini DisplayPort to VGA Adapter (MB572)
- MagSafe Airline Adapter (MB441Z/A)
- AppleCare Protection Plan (MB578LL/A)
- Aperture 2 (MB673Z/A)
- Final Cut Express (MB278Z/A)
- Logic Express (MA806LL/A)
- iWork '08 (MB624/A)

## Accessories

- Apple LED Cinema Display (MB382LL/A)
- AirPort Extreme Base Station (MB053LL/A)
- AirPort Express Base Station (MB321LL/A)
- Apple Wireless Keyboard (MB167LL/A)
- Apple wireless Mighty Mouse (MB111LL/A)
- Apple Keyboard (MB110LL/A)
- Apple wired Mighty Mouse (MB112LL/A)
- Rechargeable Battery for MacBook (MB771)

1. Actual weight varies by configuration and manufacturing process.
2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
4. 1GB=1 billion bytes; actual formatted capacity less.
5. Testing conducted by Apple in October 2008 using preproduction 2.4GHz Intel Core 2 Duo-based MacBook Pro units with a Higher Graphics Performance setting. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Apr 6, 2016



# MacBook Air (Late 2008) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:

0.16-0.76 inch (0.4-1.94 cm)

Width:

12.8 inches (32.5 cm)

Depth:

8.94 inches (22.7 cm)

Weight:

3.0 pounds (1.36 kg)<sup>1</sup>

## Processor and memory

- 1.6GHz or 1.86GHz Intel Core 2 Duo processor with 6MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 2GB of 1066MHz DDR3 SDRAM onboard

## Storage

- 120GB 4200-rpm Serial ATA hard disk drive or 128GB solid-state drive<sup>2</sup>
- Optional external USB MacBook Air SuperDrive

## Environmental status report

MacBook Air embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Highly recyclable aluminum enclosure
- Mercury-free LED-backlit display with arsenic-free glass
- PVC-free internal cables
- BFR-free internal components
- Largely recyclable, low-volume packaging
- Meets ENERGY STAR requirements
- EPEAT Gold rating

## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions: 1280 by 800 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory
- Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- Built-in iSight camera
- Mini DisplayPort

## Video output options

**DVI output** using Mini DisplayPort to DVI Adapter

**VGA output** using Mini DisplayPort to VGA Adapter

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted "T" arrangement)
- Backlit keyboard with ambient light sensor for automatic adjustment of keyboard illumination and screen brightness

# 501\_MacBook Air (Late 2008) - Technical Specifications.pdf

- Solid-state trackpad with Multi-Touch gesture support for precise cursor control; supports two-finger scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

href="/macbookair/360/index.html"

## Wireless

- Built-in AirPort Extreme Wi-Fi wireless networking<sup>4</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)

## Peripheral connections

## Audio

- Analog audio output/headphone out (minijack)
- Built-in mono speaker
- Built-in omnidirectional microphone

## Battery and power<sup>5</sup>

- Integrated 37-watt-hour lithium-polymer battery
- 45W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Installed software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand)

## What’s in the box

- MacBook Air
- 45W MagSafe Power Adapter, AC wall plug, power cord
- Install/restore DVDs
- Display cleaning cloth
- Printed and electronic documentation

## Configurations

	1.6GHz MacBook Air (MB543LL/A)	1.86GHz MacBook Air (MB940LL/A)
Enclosure	Precision aluminum unibody	
Processor	1.6GHz Intel Core 2 Duo	1.86GHz Intel Core 2 Duo
L2 cache	6MB shared	
System bus	1066MHz	
Memory	2GB of 1066MHz DDR3 SDRAM onboard	
Hard drive <sup>2</sup>	120GB 4200-rpm Serial ATA	128GB solid-state drive
Slot-loading optical drive	Optional external USB MacBook Air SuperDrive (sold separately)	
Graphics	NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>	

	<b>1.6GHz MacBook Air (MB543LL/A)</b>	<b>1.86GHz MacBook Air (MB940LL/A)</b>
<b>Video</b>	Built-in iSight camera; Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI (requires adapters, sold separately)	
<b>Display</b>	13.3-inch (diagonal) LED-backlit glossy widescreen display, 1280-by-800 resolution	
<b>USB</b>	One USB 2.0 port (up to 480 Mbps)	
<b>Audio</b>	Built-in mono speaker, built-in omnidirectional microphone, analog audio output/headphone out	
<b>Networking</b>	Optional Apple USB Ethernet Adapter (sold separately)	
<b>Wireless</b>	Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification) <sup>4</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate) module	
<b>Hardware accessories</b>	45W MagSafe Power Adapter, AC wall plug, power cord	
<b>Limited warranty and service</b>	Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
<b>Apple and the global environment</b>	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
<b>Recycling</b>	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Accessories

### MacBook Air SuperDrive (MB397G/A)

Play or burn discs directly with the external USB-based MacBook Air SuperDrive. Thin, light, and easy to take with you, this drive is designed specifically for MacBook Air.

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Size: 139 x 139 x 17 mm / 5.47 x 5.47 x 0.67 inches (L x W x H)
- Weight: 320 g (0.71 pound)
- Requires MacBook Air with available USB 2.0 port

### USB Ethernet Adapter (MB442Z/A)

No Wi-Fi? Connect to wired networks with this simple, one-piece external adapter.

### MagSafe Airline Adapter (MB441Z/A)

Plug into your airline seat power port and keep MacBook Air powered up for the entire flight.

### Mini DisplayPort to DVI Adapter (MB570)

### Mini DisplayPort to Dual-Link DVI Adapter (MB571)

### Mini DisplayPort to VGA Adapter (MB572)

Connect your MacBook Air to an external display or projector using one of these adapters.

- Time Capsule (MB276LL/A)
- AirPort Extreme Base Station (MB053LL/A)
- AirPort Express Base Station featuring iTunes (MB321LL/A)
- Apple Wireless Keyboard (MB167LL/A)
- Apple Wireless Mighty Mouse (MB111LL/A)
- Apple USB Modem (MA034Z/A)
- AppleCare Protection Plan (MB578LL/A)

1. Actual weight varies by configuration and manufacturing process.
2. 1GB=1 billion bytes; actual formatted capacity less.
3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 144MB (Intel graphics) or 256MB (NVIDIA graphics). An additional 16MB is required when using an external display.
4. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not

# 501\_MacBook Air (Late 2008) - Technical Specifications.pdf

currently compatible with AirPort.

5. Testing conducted by Apple in October 2008 using preproduction 1.86GHz Intel Core 2 Duo–based MacBook Air units. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Apr 6, 2016

# LED Cinema Display - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:  
18.84 inches (47.84 cm)  
Width:  
22.57 inches (57.32 cm)  
Depth:  
7.76 inches (19.71 cm)  
Weight:  
21 pounds (9.5 kg)

## Compatibility

Compatible with MacBook, MacBook Air, and MacBook Pro systems with Mini DisplayPort

## What's in the box

- LED Cinema Display
- AC power cord
- Cleaning cloth
- Printed documentation

## Environmental Status Report

The LED Cinema Display is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free
- Arsenic-free glass
- Brominated flame retardant-free
- PVC-free internal cables
- Meets ENERGY STAR requirements
- EPEAT Gold rating

## Display

24-inch (viewable) LED-backlit thin film transistor (TFT) active-matrix liquid crystal display

- **Supported resolutions:**
  - 1920 by 1200 pixels
  - 1280 by 800 pixels
  - 1024 by 640 pixels
- **Display colors (maximum):** 16.7 million
- **Viewing angle:** 178° horizontal; 178° vertical
- **Brightness (typical):** 330 cd/m<sup>2</sup>
- **Contrast ratio (typical):** 1000:1
- **Response time (typical):** 14 ms

## Audio and video

- Built-in iSight camera with microphone
- Built-in 2.1 speaker system

## Limited warranty and service

Your Apple LED Cinema Display comes with 90 days of free telephone technical support and a one-year limited warranty. To extend your service and support to three years from your display's purchase date, you may register one display in the AppleCare Protection Plan when you purchase the display at the same time as a MacBook Pro with Mini DisplayPort. To cover an individual display or second display, purchase the AppleCare Protection Plan for Apple Display. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple](#)

# 502\_LED Cinema Display - Technical Specifications.pdf

support or call 800-823-2775.

## Connections and expansion

- Three self-powered USB 2.0 ports
- One cable with three connectors: Mini DisplayPort, MagSafe, USB 2.0
- AC power cord
- Kensington security slot

## Electrical and operating requirements

- Input voltage: 100V to 240V AC; 50-60Hz
- Maximum power: 212W (LED Cinema Display while charging MacBook Pro)
- Energy saver mode: 1W or less

## Environmental requirements

- Operating temperature: 50° to 95° F  
(10° to 35° C)
- Storage temperature: -4° F to 116° F  
(-20° to 47° C)
- Operating humidity: 20% to 80%  
noncondensing
- Maximum operating altitude: 10,000 feet

## Configure to order

- VESA Mount Adapter Kit
- AppleCare Protection Plan

Published Date: Apr 6, 2016

# MacBook Pro (17-inch, Early 2009) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

### 15-inch MacBook Pro

Height:  
0.95 inch (2.41 cm)  
Width:  
14.35 inches (36.4 cm)  
Depth:  
9.82 inches (24.9 cm)  
Weight:  
5.5 pounds (2.49 kg)<sup>1</sup>

### 17-inch MacBook Pro

Height:  
0.98 inch (2.50 cm)  
Width:  
15.47 inches (39.3 cm)  
Depth:  
10.51 inches (26.7 cm)  
Weight:  
6.6 pounds (2.99 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- One FireWire 800 port (up to 800 Mbps)
- **15-inch MacBook Pro:** Two USB 2.0 ports (up to 480 Mbps)
- **17-inch MacBook Pro:** Three USB 2.0 ports (up to 480 Mbps)
- Mini DisplayPort
- Audio line in
- Audio line out
- ExpressCard/34 slot
- Kensington lock slot

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone (located under left speaker grille)
- Combined optical digital input/analog line in (minijack)
- Combined optical digital output/analog line out (minijack)
- Supports Apple Stereo Headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display

# 503\_MacBook Pro (17-inch, Early 2009) - Technical Specifications.pdf

- Arsenic-free glass
- BFR-free internal components
- PVC-free internal cables
- Meets ENERGY STAR requirements
- EPEAT Gold rating

## Display

### 15-inch MacBook Pro

- 15.4-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

### 17-inch MacBook Pro

- 17-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors; optional antiglare display
- **Supported resolutions:** 1920 by 1200 (native), 1680 by 1050, 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio stretched; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

### 15-inch MacBook Pro

- NVIDIA GeForce 9600M GT graphics processor; 256MB of GDDR3 memory on 2.4GHz configuration; 512MB of GDDR3 memory on 2.53GHz and 2.8GHz configurations
- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>

### 17-inch MacBook Pro

- NVIDIA GeForce 9600M GT graphics processor; 512MB of GDDR3 memory
- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>

### All Models

- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- Mini DisplayPort
- Built-in iSight camera

### Video output options

**DVI output** using Mini DisplayPort to DVI Adapter (optional)

**VGA output** using Mini DisplayPort to VGA Adapter (optional)

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter (optional)

## Input

- Built-in full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports two-finger scrolling, pinch, rotate, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

### 15-inch MacBook Pro

- 2.4GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache running 1:1 with processor speed; or 2.53GHz or 2.8GHz Intel Core 2 Duo processor with 6MB shared L2 cache
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) or 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 4GB



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## 17-inch MacBook Pro

- 2.66GHz Intel Core 2 Duo processor with 6MB on-chip shared L2 cache running 1:1 with processor speed; or 2.93GHz Intel Core 2 Duo processor with 6MB shared L2 cache
- 1066MHz frontside bus
- 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 8GB

## Storage

### 15-inch MacBook Pro

- 250GB or 320GB 5400-rpm Serial ATA hard drive<sup>4</sup>
- Optional 250GB or 320GB Serial ATA 7200-rpm hard drive<sup>4</sup>
- Optional 128GB solid-state drive<sup>4</sup>

### 17-inch MacBook Pro

- 320GB 5400-rpm Serial ATA hard drive<sup>4</sup>
- Optional 320GB 7200-rpm Serial ATA hard drive<sup>4</sup>
- Optional 128GB or 256GB solid-state drive<sup>4</sup>

## Optical drive

- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>5</sup>

### 15-inch MacBook Pro

Removable 50-watt-hour lithium-polymer battery

### 17-inch MacBook Pro

Built-in 95-watt-hour lithium-polymer battery

- 85W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

- MacBook Pro
- Display cleaning cloth
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Install/restore DVDs
- Printed and electronic documentation

## Installed software

# 503\_MacBook Pro (17-inch, Early 2009) - Technical Specifications.pdf

- Mac OS X v10.5 Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## Configurations

	15-inch, 2.4GHz MacBook Pro (MB470LL/A)	15-inch, 2.53GHz MacBook Pro (MB471LL/A)	17-inch, 2.66GHz MacBook Pro (MB604LL/A)
Enclosure	Precision aluminum unibody		
Processor	2.4GHz Intel Core 2 Duo	2.53GHz Intel Core 2 Duo	2.66GHz Intel Core 2 Duo
L2 cache	3MB shared	6MB shared	
System bus	1066MHz		
Memory	2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 4GB	4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 4GB	4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 8GB
Hard drive <sup>4</sup>	250GB Serial ATA; 5400 rpm	320GB Serial ATA; 5400 rpm	
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)		
Graphics	NVIDIA GeForce 9600M GT graphics processor; and NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>		
Graphics memory	256MB GDDR3	512MB GDDR3	
Video	Built-in iSight camera; Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI (requires adapters, sold separately)		
Display	15.4-inch (diagonal) LED-backlit glossy widescreen display, 1440-by-900 resolution		17-inch (diagonal) high-resolution LED-backlit glossy widescreen display, 1920-by-1200 resolution
Expansion	Two USB 2.0 ports (up to 480 Mbps) One FireWire 800 port (up to 800 Mbps)		Three USB 2.0 ports (up to 480 Mbps) One FireWire 800 port (up to 800 Mbps)
Audio	Built-in stereo speakers, built-in omnidirectional microphone, combined optical digital input/analog line in, combined optical digital output/analog line out		
Networking	Built-in 10/100/1000BASE-T (Gigabit) Ethernet		
Wireless	Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification) <sup>2</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate) module		
Hardware accessories	85W MagSafe Power Adapter, AC wall plug, power cord		
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer’s purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.		
Apple and the global environment	Learn more about Apple’s dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.		
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.		

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 500GB or 1TB server-grade hard drive
- Wi-Fi Certified for 802.11n draft 2.0
- USB port for connecting a USB printer or USB external hard drive

## Configure to order

- 250GB (7200-rpm) hard drive (15-inch)
- 320GB (5400-rpm) hard drive (15-inch)
- 320GB (7200-rpm) hard drive (15-inch or 17-inch)
- 128GB solid-state drive (15-inch)
- 128GB or 256GB solid-state drive (17-inch)
- Up to 4GB of 1066MHz DDR3 SDRAM (15-inch)
- Up to 8GB of 1066MHz DDR3 SDRAM (17-inch)
- Antiglare display (17-inch)
- Apple Remote (MA128G/B)
- Apple USB Modem (MA034Z/A)
- Apple Mini DisplayPort to DVI Adapter (MB570)
- Apple Mini DisplayPort to Dual-Link DVI Adapter (MB571)
- Apple Mini DisplayPort to VGA Adapter (MB572)
- MagSafe Airline Adapter (MB441Z/A)
- AppleCare Protection Plan (MB588LL/A)
- Aperture 2 (MB673Z/A)
- Final Cut Express (MB278Z/A)
- Logic Express (MA806LL/A)
- iWork '09 (MB942Z/A)

## Accessories

- Apple LED Cinema Display (MB382LL/A)
- AirPort Extreme Base Station (MB053LL/A)
- AirPort Express Base Station (MB321LL/A)
- Apple Wireless Keyboard (MB167LL/A)
- Apple Wireless Mighty Mouse (MB111LL/A)
- Apple Keyboard (MB110LL/A)
- Apple Wired Mighty Mouse (MB112LL/A)
- Rechargeable Battery for 15-inch MacBook Pro (MB772)

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. 1GB=1 billion bytes; actual formatted capacity less.
  5. For the 15-inch MacBook Pro: Testing conducted by Apple in October 2008 using preproduction 2.4GHz Intel Core 2 Duo–based MacBook Pro units with a Better Battery Life setting. For the 17-inch MacBook Pro: Testing conducted by Apple in December 2008 using preproduction 2.66GHz Intel Core 2 Duo–based MacBook Pro units with a Better Battery Life setting. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Apr 6, 2016

# MacBook (13-inch, Early 2009) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:

1.08 inches (2.75 cm)

Width:

12.78 inches (32.5 cm)

Depth:

8.92 inches (22.7 cm)

Weight:

5.0 pounds (2.27 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- Mini-DVI port
- FireWire 400 port (up to 400 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)
- Audio line in
- Audio line out
- Kensington lock slot

## Communications

Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible

Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)

Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Environmental Status Report

MacBook is designed with the following features to reduce its environmental impact:

- Highly recyclable polycarbonate enclosure
- Majority of circuit board laminates are free of brominated flame retardants
- Majority of internal cables are PVC-free
- 43% smaller packaging
- Meets ENERGY STAR requirements
- EPEAT Silver rating

## Display

13.3-inch (diagonal) glossy widescreen TFT display with support for millions of colors

**Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 768, 1024 by 640, 800 by 600, 800 by 500, 720 by 480, and 640 by 480 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

NVIDIA GeForce 9400M graphics processor with 256MB of DDR2 SDRAM shared with main memory<sup>3</sup>

Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 1920 by 1200 pixels on an external display, both at millions of colors

Built-in iSight camera

Mini-DVI port

## Video output options

**DVI output** using Mini-DVI to DVI Adapter

**VGA output** using Mini-DVI to VGA Adapter

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Solid-state scrolling trackpad for precise cursor control; supports two-finger scrolling, tap, double-tap, and drag capabilities

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone
- Combined optical digital input/analog line in (minijack)
- Combined optical digital output/analog line out (minijack)

## Processor and memory

- 2.0GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) of 667MHz DDR2 SDRAM; two SO-DIMM slots support up to 4GB

## Storage

- 120GB 5400-rpm Serial ATA hard disk drive; optional 160GB, 250GB, or 320GB 5400-rpm drive<sup>4</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)

Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW

Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, and DVD+RW; 24x CD

## Battery and power<sup>5</sup>

55-watt-hour lithium-polymer battery

60W MagSafe Power Adapter with cable management system

MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Installed software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, GarageBand, iWeb, iDVD)

## What's in the box

- MacBook

# 504\_MacBook (13-inch, Early 2009) - Technical Specifications.pdf

- Display cleaning cloth
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Lithium-polymer battery
- Install/restore DVDs
- Printed and electronic documentation

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 500GB or 1TB server-grade hard drive
- Wi-Fi Certified for 802.11n draft 2.0
- USB port for connecting a USB printer or USB external hard drive

### Configure to order

- 160GB (5400-rpm) hard drive
- 250GB (5400-rpm) hard drive
- 320GB (5400-rpm) hard drive
- Up to 4GB of 667MHz DDR2 SDRAM
- Apple Remote (MA128G/B)
- Apple Mini-DVI to DVI Adapter (M9321G/B)
- Apple Mini-DVI to VGA Adapter (M9320G/A)
- AppleCare Protection Plan (MB578LL/A)
- Aperture 2 (MB673Z/A)
- Final Cut Express (MB278Z/A)
- Logic Express (MA806LL/A)
- iWork '09 (MB942Z/A)

### Accessories

- AirPort Extreme Base Station (MB053LL/A)
- AirPort Express Base Station (MB321LL/A)
- MagSafe Airline Adapter (MB441Z/A)
- Apple Wireless Keyboard (MB167LL/A)
- Apple Wireless Mighty Mouse (MB111LL/A)
- Apple Keyboard (MB110LL/A)
- Apple Mighty Mouse (MB112LL/A)
- Rechargeable Battery for white MacBook (MA561LL/A)

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. 1GB=1 billion bytes; actual formatted capacity less.
  5. Testing conducted by Apple in January 2009 using preproduction 2.0GHz Intel Core 2 Duo-based MacBook units. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Apr 6, 2016

# Mac mini (Early 2009) - Technical Specifications

## In the box

- Mac mini
- Mini-DVI to DVI Adapter
- 110W power adapter and power cord
- Install/restore DVDs
- Printed and electronic documentation

## Processor and memory

- 2.0GHz or 2.26GHz Intel Core 2 Duo processor
- 3MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 1GB (one 1GB SO-DIMM) or 2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 4GB

## Size and weight

- Height: 2 inches (5.08 cm)
- Width: 6.5 inches (16.51 cm)
- Depth: 6.5 inches (16.51 cm)
- Weight: 2.9 pounds (1.31 kg)<sup>1</sup>

## Environmental Status Report

Mac mini is designed with the following features to reduce its environmental impact:

- BFR-free
- PVC-free (internal cables)
- Highly recyclable aluminum and polycarbonate enclosure
- Meets ENERGY STAR requirements
- Rated EPEAT Gold

## Peripheral connections

- One FireWire 800 port (up to 800 Mbps)
- Five USB 2.0 ports (up to 480 Mbps)

## Graphics and video support

- NVIDIA GeForce 9400M graphics processor with 128MB or 256MB of DDR3 SDRAM shared with main memory<sup>2</sup>
- Extended desktop and video mirroring: Simultaneously supports up to 1920 by 1200 pixels on a DVI or VGA display; up to 2560 by 1600 pixels on a dual-link DVI display using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- Mini-DVI port
- DVI output using Mini-DVI to DVI Adapter (included)
- VGA output using Mini-DVI to VGA Adapter (sold separately)
- Mini DisplayPort output

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking<sup>3</sup> (based on 802.11n draft specification); IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Optional external Apple USB Modem

## Audio

- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)
- Built-in speaker

## Storage

# 505\_Mac mini (Early 2009) - Technical Specifications.pdf

- 120GB, 250GB, or 320GB 5400-rpm Serial ATA hard disk drive<sup>4</sup>
- Slot-loading SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW): Writes DVD+R DL and DVD-R DL discs at up to 6x speed, writes DVD-R and DVD+R discs at up to 8x speed, writes DVD-RW discs at up to 6x speed, writes DVD+RW discs at up to 8x speed, reads DVDs at up to 8x speed, writes CD-R and CD-RW discs at up to 24x speed, reads CDs at up to 24x speed

## Electrical and operating requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 110W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Software

- Mac OS X v10.5 Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## Configurations

	120GB Mac mini (MB463LL/A)	320GB Mac mini (MB464LL/A)
<b>Processor</b>	2.0GHz Intel Core 2 Duo	2.0GHz Intel Core 2 Duo
<b>L2 cache</b>	3MB shared	
<b>System bus</b>	1066MHz	
<b>Memory</b>	1GB of 1066MHz DDR3 SDRAM; supports up to 4GB	2GB of 1066MHz DDR3 SDRAM; supports up to 4GB
<b>Hard drive</b>	120GB Serial ATA <sup>4</sup> ; 5400 rpm	320GB Serial ATA <sup>4</sup> ; 5400 rpm
<b>Optical drive</b>	Slot-loading 8x SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)	
<b>Graphics</b>	NVIDIA GeForce 9400M graphics processor with 128MB of DDR3 SDRAM shared with main memory <sup>2</sup>	NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>2</sup>
<b>Ports</b>	One FireWire 800 port (8 watts); five USB 2.0 ports (up to 480 Mbps); mini-DVI output; VGA output (using optional adapter); Mini DisplayPort	
<b>Audio</b>	Built-in speaker, combined optical digital audio input/audio line in, combined optical digital audio output/headphone out	
<b>Networking</b>	Built-in 10/100/1000BASE-T (Gigabit)	
<b>Wireless</b>	Built-in AirPort Extreme Wi-Fi (802.11n) <sup>3</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)	
<b>Limited warranty and service</b>	Your Mac mini comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	

## Options

### Configure to Order

- 2.26GHz Intel Core 2 Duo
- 250GB 5400-rpm hard drive
- 320GB 5400-rpm hard drive
- Up to 4GB of 1066MHz DDR3 SDRAM
- Apple LED Cinema Display
- Apple Wireless Keyboard
- Apple Keyboard
- Apple Keyboard with Numeric Keypad
- Apple Wireless Mighty Mouse
- Apple Mighty Mouse



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- Apple Remote
- iWork '09
- Aperture
- Final Cut Express
- Logic Express

## Accessories

- 110W Mac mini Power Adapter
- AirPort Express Base Station
- AirPort Extreme Base Station
- Apple Mini-DVI to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 128MB for 1GB configuration and 256MB for 2GB configuration.
  3. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  4. 1GB = 1 billion bytes; actual formatted capacity less.

Intel and Intel Core are trademarks of Intel Corp. in the U.S. and other countries. Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

Published Date: Jul 25, 2017

# Mac Pro (Early 2009) - Technical Specifications

## Processing

- 8-core: Two 2.26GHz, 2.66GHz, or 2.93GHz Quad-Core Intel Xeon 5500 series processors
- Quad-core: One 2.66GHz, 2.93GHz, or 3.33GHz Quad-Core Intel Xeon 3500 series processor
- Next-generation Intel microarchitecture
  - 8MB of fully shared L3 cache per processor
  - Integrated memory controller
  - Turbo Boost dynamic performance (up to 3.33GHz on 8-core 2.93GHz system, up to 3.6GHz on quad-core 3.33GHz system)
  - Hyper-Threading technology for up to 16 virtual cores
  - 128-bit SSE4 SIMD engine
  - 64-bit data paths and registers
  - Optimized for energy efficiency

## Memory

- 1066MHz DDR3 ECC SDRAM
- 8-core: Eight memory slots (four per processor) supporting up to 32GB of main memory using 1GB, 2GB, or 4GB DIMMs
- Quad-core: Four memory slots supporting up to 16GB of main memory using 1GB, 2GB, or 4GB DIMMs

## Graphics and displays

- Double-wide, 16-lane PCI Express 2.0 graphics slot with one of the following graphics cards installed:
  - NVIDIA GeForce GT 120 with 512MB of GDDR3 memory, PCI Express 2.0, one Mini DisplayPort, and one dual-link DVI port
  - ATI Radeon HD 4870 with 512MB of GDDR5 memory, PCI Express 2.0, one Mini DisplayPort, and one dual-link DVI port
- Multiple graphics card configurations available with two, three, or four NVIDIA GeForce GT 120 cards
- Support for up to eight 30-inch displays <sup>1</sup>
- Support for digital resolutions up to 2560 by 1600 pixels
- Support for analog resolutions up to 2048 by 1536 pixels
- Video adapters available for:
  - Additional DVI output using Mini DisplayPort to DVI Adapter (optional)
  - Additional dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (optional)
  - VGA output using Mini DisplayPort to VGA Adapter or DVI to VGA Display Adapter (optional)

## Communications

- Two independent 10/100/1000BASE-T Ethernet (RJ-45) interfaces with support for jumbo frames
- Bluetooth 2.1 + Enhanced Data Rate (EDR)
- Optional AirPort Extreme 802.11n Wi-Fi wireless networking card;<sup>2</sup> IEEE 802.11a/b/g compatible

## Storage

- Four 3.5-inch cable-free, direct-attach hard drive bays with built-in independent 3Gb/s Serial ATA channels; four internal hard drive carriers included
- Up to 8TB of internal storage<sup>3</sup> in hard drive bays 1 through 4 using hard drives in the following capacities:
  - 640GB Serial ATA 3Gb/s, 7200 rpm, 16MB cache
  - 1TB or 2TB Serial ATA 3Gb/s, 7200 rpm, 32MB cache
  - Optional Mac Pro RAID Card with 512MB cache and 72-hour cache battery backup
  - 18x SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)
    - Writes DVD+R and DVD-R discs at up to 18x speed
    - Writes DVD+R DL and DVD-R DL discs at up to 8x speed
    - Writes DVD+RW discs at up to 8x speed
    - Writes DVD-RW discs at up to 6x speed
    - Reads DVDs at up to 18x speed
    - Writes CD-R and CD-RW discs at up to 32x speed
    - Reads CDs at up to 32x speed
  - One open optical drive bay for optional second SuperDrive

## Electrical and operating requirements

- Line voltage: 100-120V AC or 200-240V AC (wide-range power supply input voltage)
- Frequency: 50Hz to 60Hz single phase
- Current: Maximum of 12A (low-voltage range) or 6A (high-voltage range)

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- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet

## Environmental Status Report

- BFR-free
- PVC-free (internal cables)
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.0 requirements<sup>4</sup>
- Rated EPEAT Gold<sup>4</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	2.66 GHz	2.26 GHz	2.66 GHz	2.26 GHz
Idle	3.7	3.5	26	25
Hard drive accessing	3.7	3.6	26	25
CD drive accessing	4.9	5.2	41	41

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Connections and audio

- Four FireWire 800 ports (two on front panel, two on back panel)
- Five USB 2.0 ports (two on front panel, three on back panel)
- Two USB 2.0 ports on included keyboard
- Front-panel headphone minijack and internal speaker
- Optical digital audio input and output TOSLINK ports
- Analog stereo line-level input and output minijacks

## PCI Express expansion

- Three open full-length PCI Express expansion slots<sup>5</sup>
  - One PCI Express 2.0 x16 slot
  - Two PCI Express 2.0 x4 slots
- All slots provide mechanical support for 16-lane cards
- 300W combined maximum for all PCI Express slots

## Software

- Mac OS X v10.6 Snow Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife (includes iPhoto, iMovie, iDVD, iWeb, and GarageBand)

You can also have the following software pre-installed, only at the Apple Online Store:

- iWork
- Final Cut Express
- Aperture
- Logic Express
- Filemaker

## Size and weight

- Height: 20.1 inches (51.1 cm)
- Width: 8.1 inches (20.6 cm)

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- Depth: 18.7 inches (47.5 cm)
- Weight (standard configuration):
  - 8-core: 41.2 pounds (18.7 kg)<sup>6</sup>
  - Quad-core: 39.9 pounds (18.1 kg)<sup>6</sup>

## In the box

- Mac Pro
- Power cord
- Apple Keyboard with Numeric Keypad and Apple Mouse
- USB keyboard extension cable
- Install/restore DVDs
- Printed and electronic documentation

## Configuration Options

	Quad-Core (MB871LL/A)	8-Core (MB535LL/A)
Processor	2.66GHz Quad-Core Intel Xeon	Two 2.26GHz Quad-Core Intel Xeon
Cache	8MB fully shared L3 cache	8MB fully shared L3 cache per processor
Memory	3GB (three 1GB DIMMs) of 1066MHz DDR3 ECC SDRAM	6GB (six 1GB DIMMs) of 1066MHz DDR3 ECC SDRAM
PCI Express 2.0 graphics	NVIDIA GeForce GT 120 with 512MB GDDR3 memory, Mini DisplayPort, and dual-link DVI video output	
Hard disk drive	640GB Serial ATA (3Gb/s); 7200 rpm	
Optical drive	18x SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)	
Wireless	Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)	
PCI Express	Three open full-length PCI Express 2.0 expansion slots with mechanical support for 16-lane cards; 300W combined maximum for all PCI Express slots	
Build-to-Order Options	<ul style="list-style-type: none"><li>• 2.93GHz Quad-Core Intel Xeon</li><li>• 3.33GHz Quad-Core Intel Xeon</li><li>• 6GB memory (three 2GB DIMMs)</li><li>• 8GB memory (four 2GB DIMMs)</li><li>• 12GB memory (three 4GB DIMMs)</li><li>• 16GB memory (four 4GB DIMMs)</li><li>• ATI Radeon HD 4870 with 512MB GDDR5</li><li>• Two NVIDIA GeForce GT 120</li><li>• Three NVIDIA GeForce GT 120</li><li>• Four NVIDIA GeForce GT 120</li><li>• Hard drive bays 1-4: 640GB Serial ATA 3Gb/s (7200 rpm) or 1TB Serial ATA 3Gb/s (7200 rpm)<sup>3</sup></li><li>• Mac Pro RAID Card</li><li>• Two 18x SuperDrive optical drives</li><li>• AirPort Extreme Wi-Fi card with 802.11n<sup>2</sup></li><li>• Apple Keyboard</li><li>• Apple Wireless Keyboard</li><li>• Dual-Channel 4Gb Fibre Channel card</li><li>• Quad-Channel 4Gb Fibre Channel card</li></ul>	<ul style="list-style-type: none"><li>• Two 2.66GHz Quad-Core Intel Xeon</li><li>• Two 2.93GHz Quad-Core Intel Xeon</li><li>• 8GB memory (four 2GB DIMMs)</li><li>• 12GB memory (six 2GB DIMMs)</li><li>• 16GB memory (eight 2GB DIMMs)</li><li>• 32GB memory (eight 4GB DIMMs)</li><li>• ATI Radeon HD 4870 with 512MB GDDR5</li><li>• Two NVIDIA GeForce GT 120</li><li>• Three NVIDIA GeForce GT 120</li><li>• Four NVIDIA GeForce GT 120</li><li>• Hard drive bays 1-4: 640GB Serial ATA 3Gb/s (7200 rpm) or 1TB Serial ATA 3Gb/s (7200 rpm)<sup>3</sup></li><li>• Mac Pro RAID Card</li><li>• Two 18x SuperDrive optical drives</li><li>• AirPort Extreme Wi-Fi card with 802.11n<sup>2</sup></li><li>• Apple Keyboard</li><li>• Apple Wireless Keyboard</li><li>• Dual-Channel 4Gb Fibre Channel card</li><li>• Quad-Channel 4Gb Fibre Channel card</li></ul>

## Upgrades

- 1GB Memory Kit
- 2GB Memory Kit
- 4GB Memory Kit
- 640GB SATA Drive Kit
- 1TB SATA Drive Kit
- 2TB SATA Drive Kit
- Promise 450GB SAS Drive for Mac Pro
- Mac Pro RAID Card
- ATI Radeon HD 4870 Graphics Upgrade Kit

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- Apple Dual-Channel 4Gb Fibre Channel PCI Express Card
- Apple Quad-Channel 4Gb Fibre Channel PCI Express Card

## Accessories

- Apple LED Cinema Display
- Time Capsule
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Keyboard
- Apple Wireless Keyboard
- Magic Mouse
- AppleCare Protection Plan

## Applications

- Final Cut Studio
- Final Cut Express
- Aperture
- Logic Pro
- Logic Express
- Mac OS X Server v10.5 (10-client license)
- Mac OS X Server v10.5 (Unlimited-client license)
- Apple Remote Desktop
- iWork

- 
1. Requires installation of four NVIDIA GeForce GT 120 graphics cards.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. 1GB = 1 billion bytes and 1TB = approximately 1 trillion bytes; actual formatted capacity less.
  4. Mac Pro systems configured with a Mac Pro RAID card or Fibre Channel card do not meet ENERGY STAR and EPEAT requirements.
  5. PCI Express slots are not compatible with PCI or PCI-X expansion cards.
  6. Actual weight varies by configuration and manufacturing process.

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Published Date: Jul 1, 2012

# iMac (Early 2009) - Technical Specifications

## Size and weight

### 20-inch iMac

Height: 18.5 inches (46.9 cm)

Width: 19.1 inches (48.5 cm)

Depth: 7.4 inches (18.9 cm)

Weight: 20 pounds (9.1 kg)<sup>1</sup>

### 24-inch iMac

Height: 20.5 inches (52.0 cm)

Width: 22.4 inches (56.9 cm)

Depth: 8.1 inches (20.7 cm)

Weight: 25.4 pounds (11.5 kg)<sup>1</sup>

## Connections and expansion

- One FireWire 800 port; 7 watts
- Total of six USB 2.0 ports: four ports on computer, two ports on wired keyboard

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking (based on IEEE 802.11n draft specification);<sup>2</sup> IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Internal 24-watt digital amplifier
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone
- Support for Apple Stereo Headset with microphone

## Software

- Mac OS X v10.5 Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## Environmental Status Report

- Arsenic-free display glass
- BFR-free
- PVC-free (internal cables)
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR 5.0 requirements
- Rated EPEAT Gold

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB			Sound Pressure Level Operator Position $L_{pAm}$ (dB)		
	2.66 GHz	2.93 GHz	3.06 GHz	2.66 GHz	2.93 GHz	3.06 GHz
Idle	3.2	3.3	3.1	21	21	20
Hard drive accessing	3.2	3.3	3.1	21	21	20
CD drive accessing	no value	no value	no value	no value	no value	no value

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

- Built-in 20-inch (viewable) or 24-inch (viewable) glossy widescreen TFT active-matrix liquid crystal display
- Resolution
  - 20-inch model: 1680 by 1050 pixels
  - 24-inch models: 1920 by 1200 pixels
- Millions of colors at all resolutions
- Typical viewing angle
  - 20-inch model:
    - 160° horizontal
    - 160° vertical
  - 24-inch models:
    - 178° horizontal
    - 178° vertical
- Typical brightness: 290 cd/m<sup>2</sup> (20-inch model); 385 cd/m<sup>2</sup> (24-inch models)
- Typical contrast ratio: 800:1 (20-inch model); 750:1 (24-inch models)

## Graphics and video support

- 20-inch and 24-inch model with 2.66GHz processor
  - NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>
- 24-inch model with 2.93GHz processor, one of the following:
  - NVIDIA GeForce GT 120 graphics processor with 256MB of GDDR3 memory
  - NVIDIA GeForce GT 130 graphics processor with 512MB of GDDR3 memory
  - ATI Radeon HD 4850 graphics processor with 512MB of GDDR3 memory
- 24-inch model with 3.06GHz processor, one of the following:
  - NVIDIA GeForce GT 130 graphics processor with 512MB of GDDR3 memory
  - ATI Radeon HD 4850 graphics processor with 512MB of GDDR3 memory
- Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI via adapter<sup>4</sup>
- Built-in iSight camera
- Support for extended desktop and video mirroring modes
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display

## Processor and memory

- 2.66GHz, 2.93GHz, or 3.06GHz Intel Core 2 Duo processor
- 6MB shared L2 cache at full processor speed
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) or 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 8GB

## Storage

### Hard drive<sup>5</sup>

- 20-inch model with 2.66GHz processor
  - 320GB 7200-rpm Serial ATA hard drive<sup>5</sup>
  - Optional 640GB or 1TB 7200-rpm Serial ATA hard drive
- 24-inch model with 2.66GHz or 2.93GHz processor
  - 640GB 7200-rpm Serial ATA hard drive
  - Optional 1TB 7200-rpm Serial ATA hard drive

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- 24-inch model with 3.06GHz processor
  - 1TB 7200-rpm Serial ATA hard drive

## Optical drive

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
  - Writes DVD+R DL and DVD-R DL discs at up to 4x speed
  - Writes DVD-R and DVD+R discs at up to 8x speed
  - Writes DVD-RW discs at up to 6x speed and DVD+RW discs at up to 8x speed
  - Reads DVDs at up to 8x speed
  - Writes CD-R discs at up to 24x speed
  - Writes CD-RW discs at up to 16x speed
  - Reads CDs at up to 24x speed

## Electrical and operating requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 200W (20-inch model); 280W (24-inch models)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## What’s in the box

- iMac
- Apple Keyboard
- Mighty Mouse
- Cleaning cloth
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

## Configurations

	20-inch iMac(MB417LL/A)	24-inch iMac(MB418LL/A)	24-inch iMac(MB419LL/A)	24-inch iMac(MB420LL/A)
Processor	2.66GHz Intel Core 2 Duo	2.66GHz Intel Core 2 Duo	2.93GHz Intel Core 2 Duo	3.06GHz Intel Core 2 Duo
L2 cache	6MB shared			
Frontside bus	1066MHz			
Memory	2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 8GB	4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 8GB		
Hard drive	320GB Serial ATA <sup>5</sup> ; 7200 rpm	640GB Serial ATA <sup>5</sup> ; 7200 rpm		1TB Serial ATA <sup>5</sup> ; 7200 rpm
Optical drive	Slot-loading 8x SuperDrive with 4x double-layer burning (DVD±R DL/DVD±RW/CD-RW)			
Display	20-inch (viewable) glossy widescreen TFT active-matrix LCD, 1680 by 1050 pixels, millions of colors	24-inch (viewable) glossy widescreen TFT active-matrix LCD, 1920 by 1200 pixels, millions of colors		
Video	Built-in iSight camera; Mini DisplayPort output with support for DVI, dual-link DVI, and VGA video connections via adapter <sup>4</sup>			
Graphics	NVIDIA GeForce 9400M with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>		NVIDIA GeForce GT 120 with 256MB of GDDR3 memory	NVIDIA GeForce GT 130 with 512MB of GDDR3 memory
FireWire	One FireWire 800 port; 7 watts			
USB	Four USB 2.0 ports on computer; two USB 2.0 ports on keyboard			



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<b>Audio</b>	Built-in stereo speakers with 24-watt digital amplifier, built-in microphone, optical digital audio output/headphone out, optical digital audio input/audio line in			
<b>Ethernet</b>	Built-in 10/100/1000BASE-T (Gigabit)			
<b>Wireless</b>	Built-in AirPort Extreme Wi-Fi (802.11n) <sup>2</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)			
<b>Hardware accessories</b>	Apple Keyboard and Apple Mighty Mouse			
<b>Other</b>	Built-in IR receiver	Built-in IR receiver, optional VESA mount adapter kit		
<b>Configure-to-order options</b>	<ul style="list-style-type: none"> <li>• 4GB Memory Upgrade (two 2GB)</li> <li>• 8GB Memory Upgrade (two 4GB)</li> <li>• 640GB or 1 TB Hard Drive</li> <li>• Apple Keyboard with Numeric Keypad</li> <li>• Apple Wireless Keyboard</li> <li>• Apple Wireless Mighty Mouse</li> <li>• Apple USB Modem</li> <li>• Apple Remote</li> <li>• Software: iWork '09, Aperture, Logic Express, Final Cut Express</li> </ul>	<ul style="list-style-type: none"> <li>• 8GB Memory Upgrade (two 4GB)</li> <li>• 1 TB Hard Drive</li> <li>• Apple Keyboard with Numeric Keypad</li> <li>• Apple Wireless Keyboard</li> <li>• Apple Wireless Mighty Mouse</li> <li>• Apple USB Modem</li> <li>• Apple Remote</li> <li>• Software: iWork '09, Aperture, Logic Express, Final Cut Express</li> </ul>	<ul style="list-style-type: none"> <li>• 3.06GHz Intel Core 2 Duo</li> <li>• NVIDIA GeForce GT 130 or ATI Radeon HD 4850 with 512MB of GDDR3 Memory</li> <li>• 8GB Memory Upgrade (two 4GB)</li> <li>• 1 TB Hard Drive</li> <li>• Apple Keyboard with Numeric Keypad</li> <li>• Apple Wireless Keyboard</li> <li>• Apple Wireless Mighty Mouse</li> <li>• Apple USB Modem</li> <li>• Apple Remote</li> <li>• Software: iWork '09, Aperture, Logic Express, Final Cut Express</li> </ul>	<ul style="list-style-type: none"> <li>• ATI Radeon HD 4850 with 512MB GDDR3 of Memory</li> <li>• 8GB Memory Upgrade (two 4GB)</li> <li>• Apple Keyboard with Numeric Keypad</li> <li>• Apple Wireless Keyboard</li> <li>• Apple Wireless Mighty Mouse</li> <li>• Apple USB Modem</li> <li>• Apple Remote</li> <li>• Software: iWork '09, Aperture, Logic Express, Final Cut Express</li> </ul>
<b>Limited warranty and service</b>	Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.			
<b>Apple and the global environment</b>	Learn more about Apple's dedication to reducing the environmental impact of our products and process. The Apple Product Environmental Specification details the environmental attributes of our products.			
<b>Recycling</b>	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.			

## Options

### Accessories

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station
- Apple Wireless Keyboard
- Apple Wireless Mighty Mouse
- Apple 8x DVD-R Media Kit
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple FireWire Cable
- AppleCare Protection Plan
- iMac 24-inch VESA Mount Adapter

### Applications

- iWork
- Aperture
- Logic Express
- Final Cut Express

1. Weight varies by configuration and manufacturing process.
2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
4. Adapters are sold separately.
5. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.

Published Date: Mar 8, 2017

# AirPort Time Capsule 802.11n (2nd Generation) - Technical Specifications

## Size and weight

- Length: 7.7 inches (197 mm)
- Width: 7.7 inches (197 mm)
- Height: 1.4 inches (36.3 mm)
- Weight: 3.5 pounds (1.6 kg)<sup>1</sup>

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>2</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Electrical

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 34W

## Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268: 2003, UL 60950, CSA-C22.2 No. 60950

## Storage

- 500GB or 1TB Serial ATA server-grade hard disk drive<sup>3</sup>

## Interfaces

- One Gigabit Ethernet WAN port for connecting a DSL or cable modem
- Three Gigabit Ethernet LAN ports for connecting computers or network devices
- USB port for connecting a USB printer or USB external hard drive
- 802.11n wireless<sup>4</sup>

## Included software and accessories

- AirPort Utility for Mac and Windows
- AirPort Disk Utility for Mac OS X v10.4 and Windows
- 802.11n Enabler for Mac OS X v10.4 Tiger<sup>5</sup>
- Bonjour for Windows
- Power cord
- Printed and electronic documentation

## Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity (operational): 20% to 80% (noncondensing)
- Relative humidity (storage): 10% to 90%
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Wireless protocols

- IEEE 802.11a/b/g/n<sup>4</sup>

# 508\_AirPort Time Capsule 802.11n (2nd Generation) - Technical Specifications.pdf

## Compatibility

- Interoperable with Wi-Fi Certified 802.11a, 802.11b, 802.11g, or 802.11n enabled Mac computers, iPhone, iPod touch, and Windows-based PCs
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP, IPv6 (6to4 and manual tunnels)

## Frequency bands

- 2.4GHz and 5GHz simultaneously

## Radio output power

- 20 dBm (nominal)

## Channels

- Channels 1-11, 36-48, and 149-165 approved for use in the United States and Canada
- Channels 1-13, 36-64, and 100-140 approved for use in Japan
- Channels 1-13, 36-64, 100-112, and 132-140 approved for use in Europe
- Channels 1-13, 36-64, and 149-165 approved for use in Australia, Hong Kong, and New Zealand

## System Requirements

	For Mac Users	For PC Users
<b>For backup using Time Machine</b>	Mac computer with Mac OS X v10.5.6 or later	-
<b>For setup and administration</b>	Mac with Mac OS X v10.4 or later, CD drive, and Ethernet or wireless networking capability	PC with Windows XP (SP3) or Windows Vista (SP1), CD drive, and Ethernet or wireless networking capability
<b>For wireless client access</b>	Mac with AirPort wireless capability	PC with Wi-Fi Certified 802.11a/b/g/n card
<b>For shared printing with a USB printer</b>	USB printer, Mac with Mac OS X v10.2.7 or later	USB printer, PC with Windows XP (SP3) or Windows Vista (SP1), Bonjour for Windows (included on Time Capsule CD)
<b>For AirPort Disk with a USB hard drive</b>	Mac with Mac OS X v10.4.8 or later	PC with Windows XP (SP3) or Windows Vista (SP1), Bonjour for Windows (included on Time Capsule CD)

## Extended service and support

The AppleCare Protection Plan for your computer covers Time Capsule.

1. Weight varies by configuration and manufacturing process.
2. Support for Wi-Fi Protected Access (WPA/WPA2) requires Mac OS X v10.3 or later or Windows XP with SP2 or later.
3. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
4. Time Capsule is based on an IEEE 802.11n draft specification and is compatible with IEEE 802.11a, IEEE 802.11b, and IEEE 802.11g.
5. The 802.11n Enabler for Mac works with the following computers running Mac OS X v10.4 Tiger: MacBook Pro with Intel Core 2 Duo; MacBook with Intel Core 2 Duo; Mac Pro with AirPort Extreme option; iMac with Intel Core 2 Duo (except the 17-inch, 1.83GHz iMac).

Wi-Fi Protected Access is a mark of the Wi-Fi Alliance. Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Some ISPs are not currently compatible with Time Capsule. Product specifications are subject to change without notice.

Published Date: Jul 12, 2013

# AirPort Extreme 802.11n (3rd Generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

- Length: 6.5 inches (165 mm)
- Width: 6.5 inches (165 mm)
- Height: 1.3 inches (34 mm)
- Weight: 1.66 pounds (753 grams)<sup>1</sup>

## Wireless protocols

- IEEE 802.11a/b/g/n<sup>2</sup>

## Frequency bands

- 2.4GHz and 5GHz simultaneously

## Radio output power

- 20 dBm (nominal)

## Compatibility

- Interoperable with Wi-Fi Certified 802.11a, 802.11b, 802.11g, or 802.11n enabled Mac computers, iPhone, iPod touch, and Windows-based PCs
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP, IPv6 (6to4 and manual tunnels)

## Included software and accessories

- AirPort Utility for Mac and Windows
- AirPort Disk Utility for Mac OS X v10.4 Tiger and Windows
- 802.11n Enabler for Mac OS X v10.4 Tiger<sup>3</sup>
- Bonjour for Windows
- Power supply with cord
- Printed and electronic documentation

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>4</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Interfaces

- One Gigabit Ethernet WAN port for connecting a DSL or cable modem
- Three Gigabit Ethernet LAN ports for connecting computers or network devices
- USB 2.0 port for connecting a USB printer or USB external hard drive
- 802.11n wireless<sup>2</sup>

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity (operational): 20% to 80%
- Relative humidity (storage): 10% to 90%
- Maximum operating altitude: 10,000 feet

- Maximum storage altitude: 15,000 feet

## Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268: 2003, UL 60950, CSA-C22.2 No. 60950

## Channels

- Channels 1-11, 36-48, and 149-165 approved for use in the United States and Canada
- Channels 1-13, 36-64, and 100-140 approved for use in Japan
- Channels 1-13, 36-64, 100-112, and 132-140 approved for use in Europe
- Channels 1-13, 36-64, and 149-165 approved for use in Australia, Hong Kong, and New Zealand

## Electrical

- 12Vdc, 1.8A

## System Requirements

	For Mac Users	For PC Users
<b>For setup and administration</b>	Mac with Mac OS X v10.4 or later, CD drive, and Ethernet or wireless networking capability	PC with Windows XP (SP3) or Windows Vista (SP1), CD drive, and Ethernet or wireless networking capability
<b>For wireless client access</b>	Mac with AirPort wireless capability	PC with Wi-Fi Certified 802.11a/b/g/n card
<b>For shared printing with a USB printer</b>	<ul style="list-style-type: none"><li>• USB printer</li><li>• Mac with Mac OS X v10.2.7 or later</li></ul>	<ul style="list-style-type: none"><li>• USB printer</li><li>• PC with Windows XP (SP3) or Windows Vista (SP1); Bonjour for Windows (included on AirPort Extreme CD)</li></ul>
<b>For AirPort Disk with a USB hard drive</b>	Mac with Mac OS X v10.4.8 or later	PC with Windows XP (SP3) or Windows Vista (SP1); Bonjour for Windows (included on AirPort Extreme CD)

## Extended service and support

The AppleCare Protection Plan for your computer covers the AirPort Extreme Base Station.

1. Weight varies by configuration and manufacturing process.
2. The AirPort Extreme Base Station is based on an IEEE 802.11n draft specification and is compatible with IEEE 802.11a, IEEE 802.11b, and IEEE 802.11g.
3. The 802.11n Enabler for Mac works with the following computers running Mac OS X v10.4 Tiger: MacBook Pro with Intel Core 2 Duo; MacBook with Intel Core 2 Duo; Mac Pro with AirPort Extreme option; iMac with Intel Core 2 Duo (except the 17-inch, 1.83GHz iMac).
4. Support for Wi-Fi Protected Access (WPA/WPA2) requires Mac OS X v10.3 or later or Windows XP with SP2 or later.

Wi-Fi Protected Access is a mark of the Wi-Fi Alliance. Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort Extreme. Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

# iPod shuffle (3rd generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:

1.8 inches (45.2 mm)

Width:

0.7 inch (17.5 mm)

Depth:

0.3 inch (7.8 mm) including clip

True volume:

0.26 cu inch (4326 cu mm)

Weight:

0.38 ounce (10.7 grams)<sup>1</sup>

for iPod shuffle in anodized aluminum

0.61 ounce (17.2 grams)<sup>1</sup>

for iPod shuffle in polished stainless steel

## External controls

- Shuffle
- Play in order
- Turn off

## Input and output

- 3.5-mm stereo headphone jack

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Capacity

- 2GB or 4GB flash drive<sup>2</sup>
- Holds up to 500 or 1,000 songs in 128-Kbps AAC format<sup>3</sup>
- Stores data via USB flash drive

## Battery and power<sup>4</sup>

- Built-in rechargeable lithium-polymer battery
- Playback time: Up to 10 hours when fully charged
- Charging via USB to computer system or power adapter (sold separately)
  - 80% charged in 2 hours; fully charged in 3 hours

## Audio

- Skip-free playback
- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV

## Environmental Status Report

# 510\_iPod shuffle (3rd generation) - Technical Specifications.pdf

iPod shuffle embodies Apple’s continuing environmental progress. It is designed with the following features to reduce environmental impact:

- BFR-free
- PVC-free
- Highly recyclable

## VoiceOver Kit

- Chinese (Cantonese)
- Chinese (Mandarin)
- Czech
- Danish
- Dutch
- English
- Finnish
- French
- German
- Greek
- Italian
- Japanese
- Korean
- Norwegian
- Polish
- Portuguese
- Russian
- Spanish
- Swedish
- Turkish

## Headphones

- Earphones with Remote
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.11 or later
- iTunes 9 or later<sup>5</sup>

## Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 3 or later
- iTunes 9 or later<sup>5</sup>

## In the box

- iPod shuffle
- Earphones with Remote
- iPod shuffle USB Cable (1.8 inches/45 mm)
- Quick Start guide

## Accessories

### In-Ear Headphones with Remote and Mic<sup>6</sup>

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you’ve been missing.

### Earphones with Remote and Mic<sup>6</sup>

These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.

### USB Power Adapter



# 510\_iPod shuffle (3rd generation) - Technical Specifications.pdf

Use this ultracompact USB-based adapter to charge your iPhone or iPod whenever it's not connected to a computer.

## iPod shuffle USB Cable

This cable, in two lengths, connects your iPod shuffle (3rd generation) to your computer's USB port for syncing and battery charging.

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1. Weight varies by configuration and manufacturing process.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Song capacity is based on 4 minutes per song and 128-Kbps AAC encoding; in 256-Kbps AAC format, song capacity is up to 250 songs (2GB) or 500 songs (4GB); actual capacity varies by encoding method and bit rate.
4. Testing conducted by Apple in February 2009 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (128-Kbps AAC). Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
5. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.
6. Mic is not supported on iPod shuffle (3rd generation).

Published Date: Apr 6, 2016

# Xserve (2009) - Technical Specifications

## In the box

- Xserve
- Rack mounting hardware
- 6' and 10" power cords
- Mac OS X Server v10.6 Install DVD
- Administration Tools CD
- Printed and electronic documentation

## Processor

- One 2.26GHz or two 2.26GHz, 2.66GHz, or 2.93GHz Quad-Core Intel Xeon 5500 series “Nehalem” processors
- 8MB shared L3 cache per processor
- Three-channel integrated memory controller per processor
- Hyper-Threading support with two threads per core (up to 16 virtual cores)
- Turbo Boost for increased performance under dynamic workloads (up to 3.33GHz on a 2.93GHz processor)
- QuickPath Interconnect
- 128-bit SSE4 SIMD engine
- 64-bit data paths and registers
- Energy efficiency optimization

## Memory

- 1066MHz DDR3 ECC memory
- Six DIMM slots (quad-core) or twelve DIMM slots (8-core) configurable to up to 48GB of SDRAM
- System supports up to 96GB in Mac OS X Server v10.6

## Storage

- Three independent hot-plug drive bays with support for qualified SATA or SAS drives; support for up to 6TB of hot-plug internal storage<sup>1</sup> using the following drive modules:
  - 160GB 7200-rpm SATA drive with 8MB disk cache<sup>2</sup>
  - 1TB 7200-rpm SATA drive with 32MB disk cache<sup>2</sup>
  - 2TB 7200-rpm SATA drive with 32MB disk cache<sup>2</sup>
  - 450GB 15,000-rpm SAS drive available as a third-party kit
- Xserve drive bays support Apple-qualified drive modules with Apple-qualified hard drives and firmware only. Drive bays not configured with a qualified drive module ship with a nonfunctional blank drive carrier and do not support installation of nonqualified third-party hard drives.
- Support for reading SMART data from Apple Drive Modules for prefailure notification
- Software RAID 0 and 1 built into Mac OS X Server
- Optional 128GB solid-state drive
- Optional Xserve RAID Card with 512MB cache and 72-hour cache battery backup; support for RAID 0, 1, and 5
- 8x SuperDrive DL (DVD±R DL/DVD±RW/CD-RW)

## I/O connections

- Two open PCI Express 2.0 x16 expansion slots: one half-length (6.6-inch) and one 9.25-inch length
- Two independent 10/100/1000BASE-T (Gigabit) RJ-45 Ethernet interfaces with support for jumbo frames
- Two FireWire 800 ports on back panel; 15W total power
- Two USB 2.0 ports (480Mb/s each) on back panel; and one USB 2.0 port on front panel
- One DB-9 serial port (RS-232)

## Video and graphics support

- NVIDIA GeForce GT 120 graphics with 256MB of GDDR3 memory and Mini DisplayPort output
- VGA output using Mini DisplayPort to VGA Adapter (sold separately)
- DVI output using Mini DisplayPort to DVI Adapter (sold separately)

## Rack support

- Fits EIA-310-D-compliant, industry-standard four-post racks and cabinets: 19 inches wide, 24 to 36 inches deep

# 511\_Xserve (2009) - Technical Specifications.pdf

- Front-to-back cooling for rack enclosure
- Support for square-hole racks or threaded racks based on mounting kit selection

## Electrical requirements

- Output power: 750W
- Optional second load-sharing 750W power supply for redundancy
- Line voltage: universal input (100V to 240V AC), power factor corrected
- Maximum input current: 8.0A (100V to 120V) or 4.0A (200V to 240V); current is shared when system is configured with two power supplies
- Frequency: 50Hz to 60Hz, single phase

## Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- FCC Class A approved

## Size and weight

- Height: 1.73 inches (4.4 cm)
- Width: 17.6 inches (44.7 cm) for mounting in standard 19-inch rack
- Depth: 30 inches (76.2 cm)
- Weight: 30.8 pounds (14.0 kg) base configuration; 38.3 pounds (17.4 kg) for 8-core system with twelve DIMMs, three 1TB SATA Apple Drive Modules, and two power supplies<sup>3</sup>

## Software

- Mac OS X Server v10.6 Snow Leopard Unlimited-Client License
- Included services
  - File and printer sharing: Mac (AFP, AppleTalk PAP, IPP), Windows (SMB/CIFS, IPP), UNIX and Linux (NFS, LPR/LPD), Internet (FTP, WebDAV)
  - Directory services: Open Directory (OpenLDAP, Kerberos, SASL), NT Domain Controller (Samba 3), Backup Domain Controller (BDC), LDAP directory connector, Active Directory connector, BSD configuration files (/etc), RADIUS
  - Mail services: SMTP (Postfix), POP and IMAP (Cyrus), SSL/TLS encryption (OpenSSL), mailing lists (Mailman), WebMail (SquirrelMail), junk mail filtering (SpamAssassin), virus detection and quarantine (ClamAV)
  - Calendaring: iCal Server 2 (CalDAV, iCalendar, iTIP, iMIP)
  - Distributed computing: Xgrid
  - File systems: HFS+ (journaled, case sensitive), read-only UFS
  - Web hosting: Apache web server (2.2 and 1.3), SSL/TLS (OpenSSL), WebDAV, PHP (5.2), Perl (5.8.8), Ruby (1.8.6), Rails (1.2.3), MySQL 5, Capistrano, Mongrel
  - Collaboration services: Wiki Server 2 (RSS), iChat Server 2 (Jabber/XMPP)
  - Application services: Apache Tomcat, Java Virtual Machine (J2SE 1.6)
  - Client management: Managed Preferences, NetBoot, NetInstall, NetRestore, Software Update Server, portable home directories
  - Networking and VPN: DNS server (BIND 9), DHCP server, NTP, Firewall (IPFW2), VPN server (L2TP, PPTP), Mobile Access Server, RADIUS, NAT server
  - Management features: Server Assistant, Server Admin, Server Preferences, Server Status widget, Workgroup Manager, System Image Utility, Secure Shell (SSH2), Server Monitor, RAID Utility, SNMPv3 (Net-SNMP)
  - High-availability features: automatic recovery, file system journaling, Software RAID, disk space monitor
  - Media streaming: QuickTime Streaming, QuickTime Broadcaster

## Environmental Status Report

The new Xserve embodies Apple's continuing environmental commitment. It is designed with the following features to reduce its environmental impact:

- BFR-free
- PVC-free (internal cables)
- Highly recyclable aluminum and stainless steel enclosure
- High-efficiency power supply (89% average)<sup>4</sup>

## Configuration Options

	Standard Configuration (MB449LL/A)	Build-to-Order Options
<b>Processor</b>	One 2.26GHz Quad-Core Intel Xeon 5500 series processor	Dual 2.26GHz, 2.66GHz, or 2.93GHz processors
<b>Memory</b>	3GB (three 1GB) 1066MHz DDR3 ECC SDRAM	Up to 24GB (quad-core) or 48GB (8-core) 1066MHz DDR3 ECC SDRAM
<b>Storage</b>	160GB 7200-rpm SATA Apple Drive Module with 8MB of cache	Up to 6TB of internal storage using 160GB, 1TB, or 2TB 7200-rpm SATA Apple Drive Modules
<b>Internal RAID</b>	Optional	Xserve RAID Card with 512MB cache and 72-hour cache battery backup
<b>Internal solid-state drive</b>	Optional	128GB solid-state drive
<b>Expansion</b>	Optional	Dual-Channel Gigabit Ethernet PCI Express Card Dual-Channel 4Gb Fibre Channel PCI Express Card Quad-Channel 4Gb Fibre Channel PCI Express Card
<b>Power supply</b>	Single 750W high-efficiency power supply	Dual redundant high-efficiency power supplies
<b>Rack support</b>	Supports most industry-standard (EIA-310-D) four-post racks and cabinets with a rack depth of 24 inches to 36 inches deep; quick-deployment rails for square-hole racks eliminates need for cage nuts	Quick-deployment rails for threaded (10/30-inch) or square-hole racks
<b>Service and support</b>	90 days of telephone support and one-year limited warranty	Optional AppleCare extended service and support products available

## Xserve Accessories

- Xserve RAID Card (MB844Z/A)
- 1GB 1066MHz DDR3 ECC DIMM (MC228G/A)
- 2GB 1066MHz DDR3 ECC DIMM (MC229G/A)
- 4GB 1066MHz DDR3 ECC DIMM (MB982G/A)
- 160GB SATA Apple Drive Module for Xserve (MB837G/A)
- 1TB SATA Apple Drive Module for Xserve (MB838G/A)
- 2TB SATA Apple Drive Module for Xserve (MC435G/A)
- Promise 450GB SAS Drive Module for Xserve (TV823ZM/A)
- Apple Dual-Port Ethernet Card (MB977G/A)
- Apple Quad-Channel 4Gb Fibre Channel Card (MB843G/A)
- Apple Dual-Channel 4Gb Fibre Channel Card (MB842G/A)
- Promise 16TB SATA VTrak E-Class RAID Subsystem (TV299VC/A)
- Promise 7.2TB SAS VTrak E-Class RAID Subsystem (TV271VC/A)
- Apple 750W Power Supply for Xserve (MB841LL/A)
- Xserve Rack Mounting Kit for Square Hole Racks (MA846G/A)
- Xserve Rack Mounting Kit for Threaded Hole Racks (MA847G/A)
- AppleCare Service Parts Kit for Xserve (MB846G/A)
- AppleCare Premium Service and Support for Xserve (MB595LL/A)

1. Maximum capacity of 6TB achieved through use of three 2TB Apple Drive Modules.
2. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
3. Weight varies by configuration and manufacturing process.
4. Average of the power supply's measured efficiency when tested at 100 percent, 50 percent, and 20 percent of the power supply's output power at 230V with the internal fan off.

Intel and Xeon are trademarks of Intel Corp. in the U.S. and other countries. Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

Published Date: Dec 4, 2009

# MacBook (13-inch, Mid 2009) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:

1.08 inches (2.75 cm)

Width:

12.78 inches (32.5 cm)

Depth:

8.92 inches (22.7 cm)

Weight:

5.0 pounds (2.27 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- Mini-DVI port
- FireWire 400 port (up to 400 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)
- Audio line in
- Audio line out
- Kensington lock slot

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Environmental Status Report

MacBook is designed with the following features to reduce its environmental impact:

- Highly recyclable polycarbonate enclosure
- Majority of circuit boards are free of brominated flame retardants
- Majority of internal cables are PVC-free
- 42% smaller packaging
- Meets ENERGY STAR Version 5.0 requirements
- Rated EPEAT Gold

## Display

13.3-inch (diagonal) glossy widescreen TFT display with support for millions of colors

**Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 768, 1024 by 640, 800 by 600, 800 by 500, 720 by 480, and 640 by 480 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR2 SDRAM shared with main memory<sup>3</sup>
- Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 1920 by 1200 pixels on an external display, both at millions of colors
- Built-in iSight camera
- Mini-DVI port

## Video output options

**DVI output** using Mini-DVI to DVI Adapter

# 512\_MacBook (13-inch, Mid 2009) - Technical Specifications.pdf

**VGA output** using Mini-DVI to VGA Adapter

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Solid-state scrolling trackpad for precise cursor control; supports two-finger scrolling, tap, double-tap, and drag capabilities

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone
- Combined optical digital input/analog line in (minijack)
- Combined optical digital output/analog line out (minijack)

## Processor and memory

- 2.13GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) of 800MHz DDR2 SDRAM; two SO-DIMM slots support up to 4GB

## Storage

- 160GB 5400-rpm Serial ATA hard disk drive; optional 250GB, 320GB, or 500GB 5400-rpm drive<sup>4</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)

Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW

Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, and DVD+RW; 24x CD

## Battery and power<sup>5</sup>

- 55-watt-hour lithium-polymer battery
- 60W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Installed software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, GarageBand, iWeb, iDVD)

## What's in the box

- MacBook
- Display cleaning cloth
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Lithium-polymer battery
- Install/restore DVDs
- Printed and electronic documentation

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 500GB or 1TB server-grade hard drive
- Wi-Fi Certified for 802.11n draft 2.0
- USB port for connecting a USB printer or USB external hard drive

### Configure to order

- 250GB (5400-rpm) hard drive
- 320GB (5400-rpm) hard drive
- 500GB (5400-rpm) hard drive
- Up to 4GB of 800MHz DDR2 SDRAM
- Apple Remote (MA128G/B)
- Apple Mini-DVI to DVI Adapter (M9321G/B)
- Apple Mini-DVI to VGA Adapter (M9320G/A)
- AppleCare Protection Plan (S3136LL/A)
- Aperture 2 (MB673Z/A)
- Final Cut Express (MB278Z/A)
- Logic Express (MA806LL/A)
- iWork '09 (MB942Z/A)

### Accessories

- AirPort Extreme Base Station (MB763LL/A)
- AirPort Express Base Station (MB321LL/A)
- MagSafe Airline Adapter (MB441Z/A)
- Apple Wireless Keyboard (MB167LL/A)
- Apple Wireless Mighty Mouse (MB111LL/A)
- Apple Keyboard (MB110LL/A)
- Apple Mighty Mouse (MB112LL/A)
- Rechargeable Battery for MacBook (MA561LL/A)

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. 1GB=1 billion bytes; actual formatted capacity less.
  5. Testing conducted by Apple in May 2009 using preproduction 2.13GHz Intel Core 2 Duo-based MacBook units. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Apr 6, 2016

# iTunes 8.1.1 for Mac - Technical Specifications

## Hardware:

- Mac computer with an Intel, PowerPC G5, G4, or G3 processor
- Screen resolution of 1024x768 or greater
- Playing videos from the iTunes Store requires a Mac computer with an Intel, PowerPC G5 or 1.0GHz PowerPC G4 or faster processor
- Playing HD-quality videos from the iTunes Store requires a 2.0GHz Intel Core 2 Duo or faster processor
- 512MB of RAM; 1GB is required to play HD-quality videos
- Playing videos also requires at least 16MB of video RAM
- A broadband Internet connection to use the iTunes Store
- An Apple combo drive or SuperDrive to create audio, MP3, or back-up CDs; some non-Apple CD-RW recorders may also work.
- An Apple SuperDrive to back up your library to DVDs; some non-Apple DVD-RW drives may also work.

## Software:

- Mac OS X version 10.4.10 or later
- QuickTime 7.5.5 or later is required
- 200MB of available disk space

## iPod and iPhone:

- Syncing purchased videos requires iPod nano (3rd generation), iPod classic, iPod (5th generation) with software version 1.2 or later, iPod touch, or iPhone
- Transferring rented movies requires iPod nano (3rd generation) and iPod classic with software version 1.1 or later or iPod touch and iPhone with iPhone software version 1.1.3 or later
- Syncing ringtones requires iPhone software version 1.1 or later
- Purchasing or syncing applications require an iPhone or iPod touch with the iPhone 2.0 Software Update or later
- Purchasing from the iTunes Music Store for iPhone or iPod touch requires iPhone software version 1.1.1 or later
- Syncing iPod Games requires iPod nano (3rd generation), iPod classic, or iPod (5th generation) with software version 1.2 or later. Some iPod Games may not be compatible with iPod nano (3rd generation) and iPod classic

## Nike + iPod:

- Nike + iPod requires a Nike + iPod Sport Kit or Sensor, a compatible iPod, and Nike+ ready shoes or compatible gym equipment
- Nike + iPod is compatible with iPod nano and iPod touch (2nd generation). iPod nano (1st generation) must have software version 1.2 or later
- To see your complete workout history on [nikeplus.com](http://nikeplus.com), an Internet connection and a free Nike.com account are required

## Apple TV:

- Renting or purchasing using Apple TV requires Apple TV software version 2.0 or later
- HD movies from the iTunes Store are designed exclusively for Apple TV and may not be transferred to iTunes

## AirPort Express with AirTunes:

- Playing your music with one or more AirPort Express base stations requires AirPort Express software version 6.3 or later
- AirPort Express with AirTunes requires an AirPort or AirPort Extreme card and a compatible stereo system or powered speakers

Published Date: Jun 11, 2009



# Final Cut Studio 5.1 (Universal) - Technical Specifications

FINAL CUT STUDIO 5.1 (Universal) - Part Numbers	
Retail	MA285Z/A
Upgrade from Final Cut Pro	MA286Z/A
Academic	MA290Z/A

## Minimum Hardware Requirements to Install All Final Cut Studio Applications

- A Macintosh computer with an 867 megahertz (MHz) or faster PowerPC G4, PowerPC G5, or Intel Core Duo processor
- HD features require a 1 gigahertz (GHz) or faster single processor or dual processors; authoring or playing back HD DVDs requires a PowerPC G5 or Intel Core Duo processor
- 512 megabytes (MB) of random-access memory (RAM)
- HD features require 1 gigabyte (GB) of RAM or more (2 GB recommended)
- Accelerated Graphics Port (AGP) or PCI Express Quartz Extreme graphics card
- Motion requires the standard graphics card found in any MacBook Pro, iMac Intel Core Duo, Power Mac G5, or iMac G5; a 1.25 GHz or faster PowerBook G4; or a 1.25 GHz or faster flat-panel iMac. One of the following graphics cards is highly recommended:
- NVIDIA GeForce Quadro FX 4500, 7800 GT, 6800 Ultra DDL, or 6800 GT DDL
- ATI Radeon X850 XT, X800 XT, 9800 XT, or 9800 Pro
- ATI Mobility Radeon X1600 or 9700

Note: Go to <http://www.apple.com/finalcutstudio/motion/specs.html> to find the latest list of supported graphics cards or to download the Motion Compatibility Checker.

- A display with 1024 x 768 resolution or higher (1280 x 1024 resolution recommended)
- A DVD drive for installation

## Minimum Software Requirements

- Mac OS X v10.4.4 (or later)
- QuickTime 7.0.4 (or later)

## Minimum Hardware Requirements to Install Individual Final Cut Studio Applications

### Final Cut Pro 5

- A Macintosh computer with a single 500 MHz or faster PowerPC G4 or G5 processor (550 MHz for PowerBook G4), any Macintosh computer with dual PowerPC G4 or G5 processors, or any Macintosh computer with an Intel Core Duo processor; 1 GHz or faster single processor or dual processors required to use HD
- 512 MB of RAM (1 GB recommended); 1 GB required to use HD
- AGP or PCI Express Quartz Extreme graphics card

### DVD Studio Pro 4

- A Macintosh computer with a 733 MHz or faster PowerPC G4, PowerPC G5, or Intel Core Duo processor; PowerPC G5 or Intel Core Duo processor required for HD
- 512 MB of RAM (1 GB recommended); authoring HD DVDs requires 1 GB of RAM (2 GB recommended)
- AGP or PCI Express Quartz Extreme graphics card
- 8 MB of video memory (32 MB recommended)
- Playback of DVD Studio Pro 4-authored HD DVDs requires a PowerPC G5 or Intel Core Duo processor
- For writing finished projects to disc: Apple SuperDrive or other DVD recorder
- For writing finished projects to a double-layer disc: a double-layer-compatible recorder and double-layer media
- For transporting projects on tape to a replicator (suggested for DVD-9 projects): DLT drive
- For transporting projects on disc that contain copy-protection or dual-layer features to a replicator: authoring DVD drive
- Source material requirements:
- Edited video files in MPEG-1, MPEG-2, HDV, HD DVD-compliant H.264, or QuickTime format
- Edited audio files in PCM, AIFF, MPEG-1 Layer 2, AC-3, DTS, or QuickTime format

### Motion 2

- A Macintosh computer with an 867 MHz or faster PowerPC G4, PowerPC G5, or Intel Core Duo processor (dual 2 GHz or faster processors recommended)
- 512 MB of RAM (2 GB of RAM or more recommended for real-time interactivity)
- Motion requires the standard graphics card found in any MacBook Pro, iMac Intel Core Duo, Power Mac G5, or iMac G5; a 1.25 GHz or faster PowerBook G4; or a 1.25 GHz or faster flat-panel iMac. One of the following graphics cards is highly recommended:
- NVIDIA GeForce Quadro FX 4500, 7800 GT, 6800 Ultra DDL, or 6800 GT DDL
- ATI Radeon X850 XT, X800 XT, 9800 XT, or 9800 Pro
- ATI Mobility Radeon X1600 or 9700

Note: Go to <http://www.apple.com/finalcutstudio/motion/specs.html> to find the latest list of supported graphics cards or to download the

# 514\_Final Cut Studio 5.1 (Universal) - Technical Specifications.pdf

Motion Compatibility Checker.

- A display with 1024 x 768 resolution or higher (1280 x 1024 resolution recommended)

## **Soundtrack Pro**

- A Macintosh computer with a single 500 MHz or faster PowerPC G4 processor, dual 450 MHz or faster PowerPC G4 processors, or any PowerPC G5 or Intel Core Duo processor (867 MHz or faster processor recommended)
- 512 MB of RAM (1 GB recommended)
- AGP or PCI Express graphics card
- A display with 1024 x 768 resolution or higher (1280 x 854 resolution recommended)

## **Available Disk Space**

- 4 GB of disk space required to install all applications (Final Cut Pro, DVD Studio Pro, Soundtrack Pro, Motion, Cinema Tools, LiveType, Compressor, and Apple Qmaster)
- Additional 42 GB required to install all optional templates, loops, content, and tutorials (may be installed on separate disks):
- 9 GB for DVD Studio Pro content
- 8 GB for Motion templates, Motion Series LiveFonts, and tutorial media
- 8 GB for Soundtrack Pro content
- 12 GB for LiveType content
- 5 GB for Apple Pro Training Final Cut Studio Tutorials media

Published Date: Jun 26, 2009

## iLife '09 - System Requirements

- Mac computer with an Intel, PowerPC G5, or PowerPC G4 (867MHz or faster) processor
- iMovie requires an Intel-based Mac, Power Mac G5 (dual 2.0GHz or faster), or iMac G5 (1.9GHz or faster).
- GarageBand Learn to Play requires an Intel-based Mac with a dual-core processor or better.
- 512MB of RAM; 1GB recommended. High-definition video requires at least 1GB of RAM.
- Approximately 4GB of available disk space
- DVD drive required for installation
- Mac OS X v10.5.6 or later
- QuickTime 7.5.5 or later (included)
- AVCHD video requires a Mac with an Intel Core Duo processor or better. Visit [iMovie '09 Camcorder Support](#) for details on digital video device and format support.
- 24-bit recording in GarageBand requires a Mac OS X-compatible audio interface with support for 24-bit audio. Please consult the owner's manual or manufacturer directly for audio device specifications and compatibility.
- iPhoto print products are available in the U.S., Canada, Japan, and select countries in Europe and Asia Pacific.
- GarageBand Artist Lessons are sold separately and are available directly through the GarageBand Lesson Store in select countries.
- Burning DVDs requires an Apple SuperDrive or compatible third-party DVD burner.
- Flickr service is available only in select countries.

Published Date: Jul 1, 2012

## **iWork ‘09 - Technical Specifications**

- Mac computer with an Intel, PowerPC G5, or PowerPC G4 (500MHz or faster) processor
- 512MB of RAM; 1GB recommended
- 32MB of video memory
- Mac OS X v10.4.11 or Mac OS X v10.5.6 or later
- QuickTime 7.5.5 or later
- 1.2GB of available disk space
- DVD drive required for installation

Some features may require Internet access; additional fees and terms may apply. Similar to iWork '08, iWork '09 does not include support for some Chinese, Japanese, or Korean (CJK) text input features such as vertical text.

Published Date: Jul 26, 2017

# Mac OS X 10.5 - Technical Specifications

## General requirements

- **Mac computer with an Intel, PowerPC G5, or PowerPC G4 (867MHz or faster) processor**
- 512MB of memory
- DVD drive for installation
- 9GB of available disk space
- Some features require a compatible Internet service provider; fees may apply.

## Feature-specific requirements

**Time Machine** requires an additional hard drive (sold separately).

**Photo Booth** requires an iSight camera (built-in or external), USB video class (UVC) camera, or FireWire DV camcorder; and an Intel or PowerPC G5 processor. Backdrop effects require an Intel Core Duo or faster processor. Backdrop effects when using a DV camcorder require fixed focus, exposure, and white balance.

**Boot Camp** requires a Mac with an Intel processor and Windows XP Service Pack 2 or Windows Vista (sold separately).

**Screen sharing** in iChat and in the Finder requires a 128-Kbps Internet connection (300-Kbps recommended).

**Front Row** requires a Mac with built-in IR and an Apple Remote.

**DVD Player** requires a 1.8GHz PowerPC G5 or faster processor for improved de-interlacing.

### iChat requirements

- Audio chats require a microphone and a 56-Kbps Internet connection.
- Video chats require an iSight camera (built-in or external), USB video class (UVC) camera, or FireWire DV camcorder; and 128-Kbps upstream and downstream Internet connection.
- Photo Booth and backdrop effects require an Intel Core Duo or faster processor.
- Backdrop effects when using a DV camcorder require fixed focus, exposure, and white balance.
- Some iChat features offer better performance and quality with higher system capabilities.

[More details](#)

**Developer tools** require 1GB of memory and an additional 3GB of available disk space.

## What's in the Box

- Installation DVD
- Welcome to Mac OS X Leopard User's Guide

Applications	Utilities	Key Technologies	Development
<ul style="list-style-type: none"> <li>• Address Book</li> <li>• Automator</li> <li>• Calculator</li> <li>• Chess</li> <li>• Dashboard</li> <li>• Dictionary</li> <li>• DVD Player</li> <li>• Exposé</li> <li>• Font Book</li> <li>• Front Row</li> <li>• iCal</li> <li>• iChat</li> <li>• Image Capture</li> <li>• iSync</li> <li>• iTunes</li> <li>• Mail</li> <li>• Photo Booth</li> <li>• Preview</li> <li>• QuickTime Player</li> <li>• Safari</li> <li>• Spaces</li> <li>• Stickies</li> <li>• System Preferences</li> <li>• TextEdit</li> <li>• Time Machine</li> </ul>	<ul style="list-style-type: none"> <li>• Activity Monitor</li> <li>• AirPort Utility</li> <li>• Audio MIDI Setup</li> <li>• Boot Camp Assistant</li> <li>• Bluetooth File Exchange</li> <li>• ColorSync Utility</li> <li>• Console</li> <li>• Digital Color Meter</li> <li>• Directory</li> <li>• Directory Utility</li> <li>• Disk Utility</li> <li>• Grab</li> <li>• Grapher</li> <li>• Keychain Access</li> <li>• Migration Assistant</li> <li>• Network Utility</li> <li>• ODBC Administrator</li> <li>• Podcast Capture</li> <li>• RAID Utility</li> <li>• Setup Assistant</li> <li>• System Profiler</li> <li>• Terminal</li> <li>• VoiceOver Utility</li> <li>• X11</li> </ul>	<ul style="list-style-type: none"> <li>• AppleScript</li> <li>• Aqua</li> <li>• Bonjour</li> <li>• CDSA security architecture</li> <li>• Cocoa, Carbon, and Java</li> <li>• ColorSync</li> <li>• Core Animation</li> <li>• Core Audio</li> <li>• Core Image</li> <li>• Core Video</li> <li>• H.264</li> <li>• Inkwell</li> <li>• OpenGL</li> <li>• PDF</li> <li>• Quartz Extreme</li> <li>• QuickTime 7</li> <li>• 64-bit computing</li> <li>• Sync</li> <li>• Unicode 4</li> <li>• Universal Access</li> <li>• UNIX</li> <li>• USB and FireWire peripheral support</li> <li>• Xgrid</li> </ul>	<ul style="list-style-type: none"> <li>• Xcode 3 IDE with Interface Builder 3</li> <li>• Instruments</li> <li>• Dashcode</li> <li>• AppleScript Studio</li> <li>• Automator 2</li> <li>• Shark</li> <li>• GCC compiler and toolset (original project by FSF.org)</li> <li>• DTrace (original project by Sun)</li> <li>• Complete Java JDK, including javac, javadoc, ANT, and Maven tools</li> <li>• Apache web server</li> <li>• AppleScript</li> <li>• Ruby and the Ruby on Rails frameworks</li> <li>• Python</li> <li>• Perl</li> <li>• PHP</li> <li>• SQLite</li> </ul>

## Languages

English | Japanese | French | German | Spanish | Italian | Dutch | Swedish | Danish | Norwegian | Finnish | Traditional Chinese | Simplified Chinese | Korean | Brazilian Portuguese | Portuguese (Portugal) | Russian | Polish

Published Date: Jul 1, 2012

# iTunes 8.2 for Mac - Technical Specifications

## Hardware:

- Mac computer with an Intel, PowerPC G5, G4, or G3 processor
- Screen resolution of 1024x768 or greater
- Playing videos from the iTunes Store requires a Mac computer with an Intel, PowerPC G5 or 1.0GHz PowerPC G4 or faster processor
- Playing HD-quality videos from the iTunes Store requires a 2.0GHz Intel Core 2 Duo or faster processor
- 512MB of RAM; 1GB is required to play HD-quality videos
- Playing videos also requires at least 16MB of video RAM
- A broadband Internet connection to use the iTunes Store
- An Apple combo drive or SuperDrive to create audio, MP3, or back-up CDs; some non-Apple CD-RW recorders may also work.
- An Apple SuperDrive to back up your library to DVDs; some non-Apple DVD-RW drives may also work.

## Software:

- Mac OS X version 10.4.10 or later
- QuickTime 7.5.5 or later
- 200MB of available disk space

## iPod and iPhone:

- Syncing purchased videos requires iPod nano (3rd generation), iPod classic, iPod (5th generation) with software version 1.2 or later, iPod touch, or iPhone
- Transferring rented movies requires iPod nano (3rd generation) and iPod classic with software version 1.1 or later or iPod touch and iPhone with iPhone software version 1.1.3 or later
- Syncing ringtones requires iPhone software version 1.1 or later
- Purchasing or syncing applications require an iPhone or iPod touch with the iPhone 2.0 Software Update or later
- Purchasing from the iTunes Music Store for iPhone or iPod touch requires iPhone software version 1.1.1 or later
- Syncing iPod Games requires iPod nano (3rd generation), iPod classic, or iPod (5th generation) with software version 1.2 or later. Some iPod Games may not be compatible with iPod nano (3rd generation) and iPod classic

## Nike + iPod:

- Nike + iPod requires a Nike + iPod Sport Kit or Sensor, a compatible iPod, and Nike+ ready shoes or compatible gym equipment
- Nike + iPod is compatible with iPod nano and iPod touch (2nd generation). iPod nano (1st generation) must have software version 1.2 or later
- To see your complete workout history on [nikeplus.com](http://nikeplus.com), an Internet connection and a free [nikeplus.com](http://nikeplus.com) account are required

## Apple TV:

- Renting or purchasing using Apple TV requires Apple TV software version 2.0 or later
- HD movies from the iTunes Store are designed exclusively for Apple TV and may not be transferred to iTunes

## AirPort Express with AirTunes:

- Playing your music with one or more AirPort Express base stations requires AirPort Express software version 6.3 or later
- AirPort Express with AirTunes requires an AirPort or AirPort Extreme card and a compatible stereo system or powered speakers

Published Date: Jun 11, 2009

# iTunes 8.2 for Windows - Technical Specifications

## Hardware:

- A PC with a 1GHz Intel or AMD processor
- Screen resolution of 1024x768 or greater
- Playing videos from the iTunes Store requires an Intel Pentium D or faster processor
- Playing HD-quality videos from the iTunes Store requires a 2.0GHz Intel Core 2 Duo or faster processor
- 512MB of RAM; 1GB is required to play HD-quality videos
- A DirectX 9.0-compatible video card with 32MB of video RAM; 64MB recommended
- A QuickTime-compatible audio card
- A broadband Internet connection to use the iTunes Store
- An iTunes-compatible CD or DVD recorder to create audio CDs, MP3 CDs, or back-up CDs or DVDs

## Software:

- Windows XP Service Pack 2 or later, or 32-bit editions of Windows Vista
- 64-bit editions of Windows Vista require the iTunes 8 64-bit installer; for more information, visit [support.apple.com/downloads/#itunes](http://support.apple.com/downloads/#itunes)
- QuickTime 7.6 (included)
- 200MB of available disk space
- Screen reader support requires Window-Eyes 7.0 or later; for information about accessibility in iTunes, visit [www.apple.com/accessibility](http://www.apple.com/accessibility)

## iPod and iPhone:

- Syncing purchased videos requires iPod nano (3rd generation), iPod classic, iPod (5th generation) with software version 1.2 or later, iPod touch, or iPhone
- Transferring rented movies requires iPod nano (3rd generation) and iPod classic with software version 1.1 or later or iPod touch and iPhone with iPhone software version 1.1.3 or later
- Syncing ringtones requires iPhone software version 1.1 or later
- Purchasing or syncing applications require an iPhone or iPod touch with the iPhone 2.0 Software Update or later
- Purchasing from the iTunes Music Store for iPhone or iPod touch requires iPhone software version 1.1.1 or later
- Syncing iPod Games requires iPod nano (3rd generation), iPod classic, or iPod (5th generation) with software version 1.2 or later. Some iPod Games may not be compatible with iPod nano (3rd generation) and iPod classic

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Published Date: Jun 11, 2009



# iPod shuffle - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iPod shuffle - Technical Specifications

Configurations	iPod shuffle
Model	 <div>M9724LL/A <sup>(512MB)</sup> M9725LL/A <sup>(1GB)</sup></div>
Storage <sup>(1)</sup> and song capacity <sup>(2)</sup>	512MB (120 songs) or 1GB (240 songs)
Battery life <sup>(3)</sup>	Up to 12 hours
Display	
iPod Ports	USB connector, stereo minijack
Connectivity	USB 1.1 and 2.0 through integrated USB connector
Charge time	About 4 hours (2-hour fast charge to 80% capacity)
Audio support	MP3 (8 to 320 Kbps), MP3 VBR, AAC (8 to 320 Kbps), Protected AAC (from iTunes Music Store, M4A, M4B, M4P), Audible (formats 2, 3, and 4) and WAV
Photo support	
Video support	
Size (in inches)	3.3 x 0.98 x 0.33
Weight	.78 ounce
Included software <sup>(4)</sup>	iTunes for Mac and Windows
Included accessories	Earbud headphones, lanyard, USB cap
Documentation	Electronic Features Guide and Printed Quick Start Guide
Limited warranty and service	Your iPod comes with single incident telephone support for the first 90 days and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> for iPod to extend your service and support to two full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.

Options & Accessories: iPod shuffle	Available from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Cables and adapters	iPod shuffle USB Power Adapter M9837LL/A iPod shuffle Battery Pack M9759G/A World Travel Adapter Kit M8794G/B
Dock	iPod shuffle Dock M9757G/A
Headphones	In-Ear Headphones M9394G/A
Cases	iPod shuffle Armband M9981G/A iPod shuffle Sport Case M9758G/A
Services	AppleCare Protection Plan M9404LL/A

### Technical Specifications: iPod shuffle

#### Capacity

- 512MB or 1GB USB flash drive<sup>(1)</sup>
- Holds 120 or 240 songs in 128-Kbps AAC format<sup>(2)</sup>
- Stores data via USB flash drive

#### Audio

- Skip-free playback
- Frequency response: 20Hz to 20,000Hz
- MP3 (8 to 320 Kbps), MP3 VBR, AAC (8 to 320 Kbps), Protected AAC (from iTunes Music Store, M4A, M4B, M4P), Audible (formats 2, 3 and 4) and WAV
- Upgradable firmware enables support for future audio formats

#### Headphones

- Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets

# 51\_iPod shuffle - Technical Specifications.pdf

- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Mac system requirements

- Macintosh computer with USB port<sup>(5)</sup>
- Mac OS X v10.2.8 or Mac OS X 10.3.4 and later (Mac OS X 10.3.6 or later recommended for use with low-power USB ports)

## Windows system requirements

- PC with USB port<sup>(5)</sup>
- Windows 2000 with Service Pack 4 or later or Windows XP Home or Professional with Service Pack 2 or later

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Non operating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Input and output

- USB connector
- 3.5-mm stereo headphone minijack

## Power and battery<sup>(3)</sup>

- Built-in rechargeable lithium ion battery
- Playtime: Up to 12 hours when fully charged
- Standby time: 1 month when fully charged
- Charging via USB to computer system or power adapter
  - Full-charge time: about 4 hours

## Size and weight

- Height: 3.3 in.
- Width: .98 in.
- Depth: 0.33 in.
- Weight: 0.78 oz (22 g)

1. 1MB = 1 million bytes, 1GB = 1 billion bytes; actual formatted capacity less.

2. Song capacity based on 4 minutes per song and 128-Kbps AAC encoding.

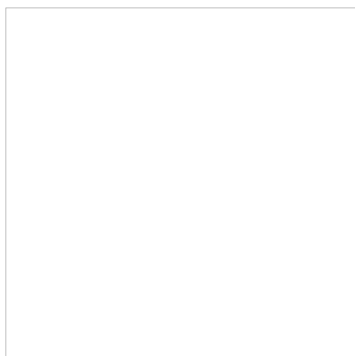
3. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

4. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

5. Some computers require either the optional iPod shuffle Dock or a USB cable extender (sold separately).

Published Date: Apr 6, 2016

# QuickTime Pro 7 - Technical Specifications



## Overview

- **Please note:**  
Your QuickTime 7 Pro registration code only works with QuickTime 7. Be sure you have downloaded and installed [QuickTime Player 7](#) before you enter your QuickTime 7 Pro registration code.
- **Convert media formats**  
Convert your QuickTime movies to a variety of formats for viewing on your iPod or mobile phone or sharing with friends and family via email or the web.<sup>1</sup> Export to over a dozen different video and audio formats.
- **Edit with ease**  
Use the cut, copy and paste capabilities of QuickTime Pro to edit your movies or even add a new sound track. You can even add annotations, rotate your video and more.
- **Create stunning video**  
With your iSight or other FireWire camera connected to your Mac, you can create beautiful video with a single click and share it via email.
- **Build your QuickTime video library**  
Build a library of movies by saving them from the web to your computer for enjoyment any time.<sup>2</sup> View movies shot with your camera phone, digital camera or camcorder. QuickTime 7 Pro supports major video formats including H.264, MPEG-4 and Motion JPEG.
- **Record your podcast**  
Plug in a USB microphone and use QuickTime 7 Pro to capture audio that can be shared with the world as a podcast. The one-button recording interface couldn't be simpler or easier to use.

## How to upgrade to QuickTime Pro

- Make sure QuickTime 7 Player is installed on your computer.
- Purchase a QuickTime Pro registration code, which will be sent via email.
- Open the email from Apple and locate the 20-digit registration code.
- Go to [http://www.apple.com/quicktime/pro/unlock-mac\\_osx.html](http://www.apple.com/quicktime/pro/unlock-mac_osx.html) and follow the instructions to enter your registration code.
- Enjoy QuickTime Pro!

## System Requirements

- Mac OS X v10.5 or later
- A Mac computer with an Intel, PowerPC G5 or Power PC G4 (867MHz or faster) processor
- At least 512MB of RAM
- QuickTime 7

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Please note: There will be no package shipped to you and no more software to download — you can begin using QuickTime Pro straightaway.  
Please note: A more powerful computer will deliver improved performance.

1. QuickTime Pro does not support ripping of DVDs.
2. Some content creators do not allow their movies on the web to be saved.

# iTunes 8.0.2 for Mac - Technical Specifications

## Hardware:

- Mac computer with an Intel, PowerPC G5, G4, or G3 processor
- Playing videos from the iTunes Store requires a Mac computer with an Intel, PowerPC G5 or 1.0GHz PowerPC G4 or faster processor
- Playing HD-quality videos from the iTunes Store requires a 2.0GHz Intel Core 2 Duo or faster processor
- 512MB of RAM; 1GB is required to play HD-quality videos
- Playing videos also requires at least 16MB of video RAM
- A broadband Internet connection to use the iTunes Store
- An Apple combo drive or SuperDrive to create audio, MP3, or back-up CDs; some non-Apple CD-RW recorders may also work.
- An Apple SuperDrive to back up your library to DVDs; some non-Apple DVD-RW drives may also work.

## Software:

- Mac OS X version 10.4.9 or later
- QuickTime 7.5.5 or later is required
- 200MB of available disk space

## iPod and iPhone:

- Syncing purchased videos requires iPod nano (3rd generation), iPod classic, iPod (5th generation) with software version 1.2 or later, iPod touch, or iPhone.
- Transferring rented movies requires iPod nano (3rd generation) and iPod classic with software version 1.1 or later or iPod touch and iPhone with software version 1.1.3 or later.
- Syncing ringtones requires iPhone software version 1.1 or later.
- Purchasing or syncing applications require an iPhone or iPod touch with the iPhone 2.0 Software Update or later.
- Purchasing from the iTunes Wi-Fi Music Store requires iPhone or iPod touch with software version 1.1.1 or later.
- Syncing iPod Games requires iPod nano (3rd generation), iPod classic, or iPod (5th generation) with software version 1.2 or later. Some iPod Games may not be compatible with iPod nano (3rd generation) and iPod classic.

## Nike + iPod:

- Nike + iPod requires a Nike + iPod Sport Kit or Sensor, a compatible iPod, and Nike+ ready shoes.
- Nike + iPod is compatible with iPod nano and iPod touch (2nd generation). iPod nano (1st generation) must have software version 1.2 or later.
- To see your workout data on [nikeplus.com](http://nikeplus.com), an Internet connection and a free [Nike.com](http://Nike.com) account are required.

## Apple TV:

- Renting or purchasing using Apple TV requires Apple TV software version 2.0 or later.
- HD movies from the iTunes Store are designed exclusively for Apple TV and may not be transferred to iTunes.

## AirPort Express with AirTunes:

- Playing your music with one or more AirPort Express base stations requires AirPort Express software version 6.3 or later.
- AirPort Express with AirTunes requires an AirPort or AirPort Extreme card and a compatible stereo system or powered speakers.

Published Date: Jun 11, 2009

# iTunes 8.0.2 for Windows - Technical Specifications

## Hardware:

- A PC with a 1GHz Intel or AMD processor
- Playing videos from the iTunes Store requires an Intel Pentium D or faster processor
- Playing HD-quality videos from the iTunes Store requires a 2.0GHz Intel Core 2 Duo or faster processor
- 512MB of RAM; 1GB is required to play HD-quality videos
- A DirectX 9.0-compatible video card with 32MB of video RAM; 64MB recommended
- A QuickTime-compatible audio card
- A broadband Internet connection to use the iTunes Store
- An iTunes-compatible CD or DVD recorder to create audio CDs, MP3 CDs, or back-up CDs or DVDs

## Software:

- Windows XP Service Pack 2 or later, or 32-bit editions of Windows Vista
- 64-bit editions of Windows Vista require the iTunes 8 64-bit installer; for more information, visit [support.apple.com/downloads/#itunes](http://support.apple.com/downloads/#itunes).
- QuickTime 7.5.5 or later is required (included)
- 200MB of available disk space
- Screen reader support requires Window-Eyes 7.0 or later; for information about accessibility in iTunes, visit [www.apple.com/accessibility](http://www.apple.com/accessibility).

## iPod and iPhone:

- Syncing purchased videos requires a iPod nano (3rd generation), iPod classic, iPod (5th generation) with software version 1.2 or later, iPod touch, or iPhone.
- Transferring rented movies requires iPod nano (3rd generation) and iPod classic with software version 1.1 or later or iPod touch and iPhone with software version 1.1.3 or later.
- Syncing ringtones requires iPhone software version 1.1 or later.
- Purchasing or syncing applications require an iPhone or iPod touch with the iPhone 2.0 Software Update or later.
- Purchasing from the iTunes Wi-Fi Music Store requires iPhone or iPod touch with software version 1.1.1 or later.
- Syncing iPod Games requires a iPod nano (3rd generation), iPod classic, or iPod (5th generation) with software version 1.2 or later. Some iPod Games may not be compatible with iPod nano (3rd generation) and iPod classic.

## Nike + iPod:

- Nike + iPod requires a Nike + iPod Sport Kit or Sensor, a compatible iPod, and Nike+ ready shoes.
- Nike + iPod is compatible with iPod nano and iPod touch (2nd generation). iPod nano (1st generation) must have software version 1.2 or later.
- To see your workout data on [nikeplus.com](http://nikeplus.com), an Internet connection and a free [Nike.com](http://Nike.com) account are required.

## Apple TV:

- Renting or purchasing using Apple TV requires Apple TV software version 2.0 or later.
- HD movies from the iTunes Store are designed exclusively for Apple TV and may not be transferred to iTunes.

## AirPort Express with AirTunes:

- Playing your music with one or more AirPort Express base stations requires AirPort Express software version 6.3 or later.
- AirPort Express with AirTunes requires an AirPort or AirPort Extreme card and a compatible stereo system or powered speakers.

Published Date: Jun 11, 2009

# Aperture 2 - Technical Specifications

Aperture 2 - Part Numbers	
Retail	MB284Z/A
Upgrade	MB286Z/A
Academic	MB285Z/A

## Minimum Hardware Requirements

- One of the following Mac computers:
  - Mac Pro
  - 15- or 17-inch MacBook Pro
  - MacBook
  - Mac mini with an Intel Core Solo or Duo processor
  - iMac with a 1.8 GHz or faster PowerPC G5 or Intel Core Duo processor
  - Power Mac G5 with a 1.6 GHz or faster PowerPC G5 processor
  - 15- or 17-inch PowerBook G4 with a 1.25 GHz or faster PowerPC G4 processor
- 1 GB of random-access memory (RAM)
- 2 GB of RAM required for Mac Pro
- One of the following graphics cards:
  - ATI Radeon X600 Pro, X600 XT, X800 XT Mac Edition, X850 XT, X1600, X1900 XT, 9800 XT, 9800 Pro, 9700 Pro, 9600, 9600 XT, 9600 Pro, 9650, HD 2400 XT, or HD 2600 Pro
  - ATI Mobility Radeon 9700 or 9600
  - ATI Mobility X1600
  - NVIDIA GeForce FX 5200 Ultra, 6600, 6600 LE, 6800 Ultra DDL, 6800 GT DDL, 7300 GT, 7800 GT, or 8600M GT
  - NVIDIA Quadro FX 4500
  - Intel GMA950
- DVD drive for installation

## Minimum Software Requirements

- Mac OS X v10.4.11 Tiger
- Mac OS X v10.5.2 Leopard (or later)

## Recommended Configuration

- Mac computer with a 2 GHz or faster Intel Core Duo processor or dual 2 GHz or faster PowerPC G5 processors
- 2 GB of RAM
- One of the following graphics cards:
  - ATI Radeon X800 XT Mac Edition, 9800 XT, 9800 Pro, X1900 XT, or X1600
  - NVIDIA GeForce 6800 series or 7800 GT
  - NVIDIA Quadro FX 4500
  - 5 GB of disk space for the application and sample projects

## Available Hard Disk Space

Aperture and its associated features require a certain amount of available disk space:

- 5 GB of disk space for the application and sample projects

## Input

- Import images directly from cameras and storage devices
  - CompactFlash I, CompactFlash II, and Microdrive
  - Memory Stick and Memory Stick Duo
  - Secure Digital, MultiMedia, and SmartMedia cards
  - xD-Picture cards
- Import from multiple cards simultaneously
- Drag in files from any volume (preserves Finder folder hierarchy)
- Browse and import directly from iPhoto library
- Capture images directly from tethered Nikon and Canon cameras<sup>1</sup>

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## File Formats

- Native RAW import and editing of images from leading digital cameras and camera backs (See [RAW support page](#) for model listing.)
  - .ARW, .CR2, .CRW, .MOS, .NEF, .RAF, .RAW, .SRW, .TIF, .OLY, .FFF, .3FR, .DNG<sup>2</sup>
- Compatible with all major still image formats
  - JPEG, GIF, TIFF, PNG, PDF, PSD<sup>3</sup>

## Photo Management

- Store photographs anywhere: external hard drives, RAID arrays, optical media
- Import photos into an Aperture-managed library or reference them in place without copying or moving them from their physical locations
- Use file management tools to consolidate masters, move referenced images, manage offline photographs, and check status (such as online/offline or referenced)
- Rename master files on disk
- Use Folder Name Presets to create folders and subfolders automatically when importing or relocating master images
- Append additional metadata or replace existing metadata entirely during a batch change
- Work with thousands of projects
- Locate images quickly with the high-performance database
- Organize photos in projects and albums
- Include up to 100,000 master images in a project with as many versions as needed
- Create albums from any combination of images
- Combine photos from multiple projects into albums
- Detect duplicates on import
- Search using Smart Albums based on metadata queries
- Archive and back up with one click
- Back up to multiple drives concurrently
- Track backup status and location of all images

## Image Processing

- Preserve original images with nondestructive image processing
- Create alternate versions without using extra disk space
- Tweak RAW Decode setting using fine-tuning controls:
  - Boost (reduce or increase image contrast)
  - Hue Boost
  - Sharpening
  - Moire
  - Auto Noise Compensation
- Save individual adjustments as Adjustment Presets and apply them whenever needed
- Choose the version of the RAW decode on an image-by-image basis to produce the best-quality images
- Use the Color Meter to sample pixel values in RGB, CMYK, or LAB anywhere in an image; display in HSB (hue, saturation, brightness) or HSL (hue, saturation, luminance)
- Use Hot and Cold Pixel overlays to show pixels that are out of range
- Adjust images using photographer's essential nondestructive editing tools:
  - Exposure
  - Highlight Recovery
  - Black Point
  - Vibrancy
  - Definition
  - Histogram
  - Levels
  - Color
  - Highlights and Shadows
  - Edge Sharpen
  - White Balance
  - Monochrome filter with RGB Channel Mixer
  - Crop
  - Straighten
  - Flip Image
  - Red-eye Correction
  - Noise Reduction
  - Vignette and Devignette
  - Retouch (soft-edged Repair and Clone)

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- Color Monochrome filter
  - Sepia Tone filter
- Spot and Patch tools
- Lift and Stamp tool to copy and paste adjustments
- Stacks to manage alternate versions
- Seamless Photoshop integration:
  - One-click export directly to Photoshop as PSD or TIFF (8-bit or 16-bit)
  - Native support for flattened or single-layer PSD files<sup>3</sup>
  - Management of Photoshop-generated image versions
- Plug-in architecture enables third-party imaging software to work with either TIFF or RAW images directly within Aperture as plug-ins.
- Dodge & Burn plug-in adds brush-based tools for Dodge (Lighten), Burn (Darken), Contrast, Saturation, Sharpen, and Blur.

## Compare and Select Tools

- Stacks
  - Group sequences of shots
  - Automatically group bursts and bracketed shots
  - Manually stack alternate shots
  - Collapse entire shoots down to selects
- Full-screen workspace for comparing images
- Viewing of multiple images side by side
- Simultaneous zooming of multiple images
- Quick Preview mode for rapid-fire image browsing
- Compare mode for selecting shots
- Digital Loupe tool for magnifying images
- Digital Light Table for organizing images and creating comp layouts

## Output

- ColorSync color-managed output
- Onscreen soft proofing
- Specify size and resolution of exported images
- Embed ColorSync and ICC profile data during file export
- Embed IPTC metadata during file export
- Drag-and-drop JPEG export into Mac OS X applications
- Export IPTC metadata as XMP sidecar files or embed into master images on export
- Expert local printing:
  - Images
  - Customizable contact sheets
  - Light Table comps
  - Gamma adjustment
  - Black point compensation
  - Print sharpening with radius control
- Order color-managed prints online
- Publish photos to MobileMe Gallery
  - Password-protect MobileMe Gallery
  - Allow downloading of JPEGs or master images
  - Sync published MobileMe Gallery with library automatically
- Integrated layout and authoring tools for web
- Integrated layout and authoring tools for books
  - Fully customizable template library
  - High-resolution book printing
- Create and order professionally printed books
  - Three sizes: small (softcover), medium (softcover), and large (softcover or hardcover)
  - Full-bleed dust jackets and foil-stamped covers (for hardcover only)
  - Layout tools for specifying size, position, and angle of photos on page
- Built-in Automator workflows to automatically generate JPEG or TIFF images from book pages

## User Interface

- Streamlined interface designed for photographic work
- Color-neutral user interface palette
- Adjustable background luminance



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- Customizable window layouts
- Integrated Projects, Metadata, and Adjustments Inspectors
- Variable-size thumbnails
- Heads-up displays, tools, and controls
- Full Screen mode for single or multiple displays
- All Projects view for visually skimming contents of projects
- Default tools in Adjustments Inspector customizable
- Keyboard-controllable adjustment tools
- Media Browser in iLife, iWork, and throughout Leopard for access to Aperture library, albums, and Smart Albums across the Mac OS
- Customizable keyboard shortcuts
- Built-in iPhoto Browser to access iPhoto images from within Aperture
- Syncing of albums, Smart Albums, or entire Aperture library to iPod, iPhone, or Apple TV using iTunes
- Control of slideshows with Apple Remote
- Export API for access to third-party services via vendor-supplied export plug-ins
- Gesture support for Multi-Touch trackpads

### Metadata

- Comprehensive IPTC and EXIF metadata support
- View, extract, or add any metadata
- Define custom metadata sets
- Speed metadata entry by creating Metadata Presets — prefilled IPTC presets from copyright, captions, and other metadata fields
- Customize display of metadata throughout workflow
- Add metadata automatically to batches on import
- Embed IPTC metadata on export of versions or master images
- Use powerful Query tool for searching, sorting, and sifting
- Search images based on adjustments applied
- Adjust time and date to correct timestamps on images
- Lift and Stamp tool for copying and pasting metadata

- 
1. Tethering requires compliance with standard protocols that are not supported by all camera models. See "[Aperture 2: Tips on tethered shooting](#)" for some guidelines concerning the support of tethered cameras.
  2. DNG files must be generated by the Adobe DNG Converter with the "Convert to Linear Image" option turned off.
  3. Aperture maintains but does not display layer and alpha channel information in PSD files.

Published Date: Sep 30, 2011

# iTunes 8.1.1 for Windows - Technical Specifications

## Hardware:

- A PC with a 1GHz Intel or AMD processor
- Screen resolution of 1024x768 or greater
- Playing videos from the iTunes Store requires an Intel Pentium D or faster processor
- Playing HD-quality videos from the iTunes Store requires a 2.0GHz Intel Core 2 Duo or faster processor
- 512MB of RAM; 1GB is required to play HD-quality videos
- A DirectX 9.0-compatible video card with 32MB of video RAM; 64MB recommended
- A QuickTime-compatible audio card
- A broadband Internet connection to use the iTunes Store
- An iTunes-compatible CD or DVD recorder to create audio CDs, MP3 CDs, or back-up CDs or DVDs

## Software:

- Windows XP Service Pack 2 or later, or 32-bit editions of Windows Vista
- 64-bit editions of Windows Vista require the iTunes 8 64-bit installer; for more information, visit [support.apple.com/downloads/#itunes](http://support.apple.com/downloads/#itunes)
- QuickTime 7.6 is required (included)
- 200MB of available disk space
- Screen reader support requires Window-Eyes 7.0 or later; for information about accessibility in iTunes, visit [www.apple.com/accessibility](http://www.apple.com/accessibility)

## iPod and iPhone:

- Syncing purchased videos requires iPod nano (3rd generation), iPod classic, iPod (5th generation) with software version 1.2 or later, iPod touch, or iPhone
- Transferring rented movies requires iPod nano (3rd generation) and iPod classic with software version 1.1 or later or iPod touch and iPhone with iPhone software version 1.1.3 or later
- Syncing ringtones requires iPhone software version 1.1 or later
- Purchasing or syncing applications require an iPhone or iPod touch with the iPhone 2.0 Software Update or later
- Purchasing from the iTunes Music Store for iPhone or iPod touch requires iPhone software version 1.1.1 or later
- Syncing iPod Games requires iPod nano (3rd generation), iPod classic, or iPod (5th generation) with software version 1.2 or later. Some iPod Games may not be compatible with iPod nano (3rd generation) and iPod classic

## Nike + iPod:

- Nike + iPod requires a Nike + iPod Sport Kit or Sensor, a compatible iPod, and Nike+ ready shoes or compatible gym equipment
- Nike + iPod is compatible with iPod nano and iPod touch (2nd generation). iPod nano (1st generation) must have software version 1.2 or later
- To see your complete workout history on [nikeplus.com](http://nikeplus.com), an Internet connection and a free [Nike.com](http://Nike.com) account are required

## Apple TV:

- Renting or purchasing using Apple TV requires Apple TV software version 2.0 or later
- HD movies from the iTunes Store are designed exclusively for Apple TV and may not be transferred to iTunes

## AirPort Express with AirTunes:

- Playing your music with one or more AirPort Express base stations requires AirPort Express software version 6.3 or later
- AirPort Express with AirTunes requires an AirPort or AirPort Extreme card and a compatible stereo system or powered speakers

Published Date: Jun 11, 2009

# Logic Express 8 - Technical Specifications

Logic Express 8 - Part Numbers	
Retail	MA806LL/A
Upgrade from Logic Express 6,7,8	MA810LL/A
Academic	MA809LL/A

## Logic Express System Requirements

- Mac computer with a 1.25GHz or faster PowerPC G4 processor (PowerPC G5, Intel Core Duo, or Intel Xeon processor recommended)
- 1GB of RAM
- Display with 1024-by-768 resolution
- Mac OS X v10.4.9 or later
- QuickTime 7.2 or later
- 6GB of available disk space
- DVD drive for installation
- Low-latency multi-I/O audio hardware and MIDI interface recommended

## Logic Express Recommendations

- A Macintosh PowerPC G5, or Intel Core Duo or Xeon processor
- 2 to 4 Gigabyte (GB) of random-access memory (RAM) for large EXS instruments
- A display with 1280 x 800 resolution
- A PCI Express, ExpressCard/34, or FireWire based audio interface
- A MIDI interface and keyboard (or suitable USB device)

## Contents

- Application DVD
- Content DVD
- Printed and electronic documentation

## Streamlined Interface

- Unified window design consolidates multiple edit and browser areas
- Library browser makes it easy to find audio files, channel strip settings, and plug-in settings
- Inspector provides convenient access to region and track parameters as well as primary mix functions via the innovative Dual Channel Strip
- Assign tools to mouse and view current assignments directly in the Arrange window
- Simple multiple track creation and setup
- Customizable tool and transport bars
- Context-sensitive shortcut menus
- Definable startup behavior
- Enhanced plug-in headers for all instruments and effects
- Global Tracks for graphical editing of key and time signatures, markers, tempo, and transposition
- Selectable time- and/or beat-based bar ruler for time-linear and/or beat-linear display in the Arrange window
- Waveform zoom slider for improved visibility of low-level signals
- Extensive zoom tools and functions

## Ultimate writing studio

- Extensive MIDI composition
  - Region-based quantize, transpose, gate, swing and velocity control
  - MIDI Groove templates
  - Creative MIDI processing and routing in the Environment
  - Caps Lock Keyboard for note entry using computer keyboard
  - Custom and Hermode tuning
  - MIDI step entry
- Full support for Apple Loops

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- Apple Loops browser for finding and previewing loops based on tempo, key, style, and mood
- Export of MIDI and audio regions as Apple Loops
- Edit plug-ins and MIDI performances for Software Instrument loops
- Independent loop transposition
- Comprehensive loop tagging and editing with Apple Loops Utility
- Complete music notation
  - Real-time transcription
  - Instrument transposition
  - Guitar tablature
  - Drum notation
  - Chord symbols
  - Adaptive lyric input
  - Automatic multibar rests
  - Comprehensive palette of slurs, crescendos, and other ornaments
  - Staff Styles for easy recall of multiple stave attributes
  - Score Sets allow instruments to be combined for editing and print
  - Layout and printing of complete professional scores
- Robust video playback features
  - Embedded or floating video window display
  - Digital Cinema Desktop for display of full screen video on second monitor
  - External video output via Firewire or DVCPro HD
  - Global video thumbnail track
  - Scene detect option to mark video transitions automatically
- Fast and intuitive region looping
- Global chord track with automatic chord recognition

## Production powerhouse

- Over 980 definable key and MIDI commands
- 90 recallable screen configurations
- Audio file and I/O resolution up to 24-bit/192kHz
- Internal audio resolution: 32-bit floating point; 64-bit precision where required
- Extended project length: 6 hours at 96kHz; 13 hours at 44.1kHz
- .Mac backup and sharing of preferences and settings
- Use of an Apple Remote to control Logic Express 8 from a distance, with the ability to play, stop, record, rewind, fast-forward, and move to the next or previous track
- High-end POW-r dithering algorithm
- Seamless punch-on-the-fly recording
- Low latency mode to remove plug-in induced latency during recording
- Graphic beat mapping for creating tempo maps from existing audio
- Well-designed collection of production-ready templates
- Multiple documents open at once
- Bounce to AIFF, WAV (Broadcast Wave), CAF, SDII, MP3, M4A (Apple Lossless, AAC)
- Fast, offline bouncing of single or multiple tracks
- Burn any bounced audio directly to CD or DVD-A (PCM only)
- Asset management simplifies consolidation and transport of projects and their dependent assets
- MIDI note extraction from audio for drum replacement and melodic transcription
- Freeze Tracks feature releases CPU resources by invisibly rendering tracks
- Extreme Compatibility
  - Open GarageBand songs directly in Logic Express
  - Support for Apple Core Audio
  - Support for Audio Units plug-ins
  - Support for AAF, OMF, Open TL, and XML (Final Cut Pro)
  - Streamlined ReWire support for optimized integration with Reason, Ableton Live, and other ReWire-compatible applications
- Serial-based copy protection
- Powerful folders to facilitate organization and streamline various arranging tasks

## Precision Editing

- Intuitive region-based MIDI and audio editing
- Comprehensive set of editing tools assignable to left, right, and key-modified mouse buttons
- Effortless take management
  - Region-based take recording and management in automatically generated take folders
  - Pack existing tracks into take folders

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- Single-click take selection
- Colorize takes on the fly
- Intelligent unpacking of take folders onto separate tracks
- Move and edit entire take folders like any other region
- Revolutionary Quick Swipe Comping
  - Build a comp track from multiple takes
  - Create comps on the fly
  - Audition comps in real time
  - Automatic, customizable crossfades between phrases
  - Flatten function replaces take folder with regions that represent the current comp
  - Flatten and Merge function replaces take folder with newly created audio file
- Multiple MIDI editors
  - Piano Roll
  - Score
  - Hyper
  - Event List
  - Transform
- Graphical time stretching and compression in the Arrange window
- Sample-accurate editing in the Arrange window
- Definable relative or absolute snap grid
- Nondestructive graphical fades and crossfades
- Snap-to-transient selection
- Shuffle and Auto-Crossfade Arrange Edit modes
- Destructive sample editing using built-in or external sample editor like Soundtrack Pro 2
- 10,000-step undo history
- Time-linear and/or beat-linear display in the Arrange window

### Professional Mixing and Automation

- Track Mixer views simplify mixer channel navigation
- Dynamic channel strip creation accelerates mixer setup and configuration
- Easy setup of multi-output software instruments
- Signal Flow view option shows all channel strips (e.g., Aux, Output, Master) within the audio signal path of the selected channel strip
- Save/Load complete plug-in configurations using channel strip settings
- Sample-accurate, track-based 32-bit automation
- Track- or region-based solo and mute
- Track mute/solo in either Fast or CPU-Saving mode
- Solo safe mode for any channel strip
- Direct insert patching of external hardware instruments and effects
- Exponential or dB-linear level meter scaling
- Busses as sources for recording
- Inline input monitoring
- Up to 255 independent mono or stereo audio channels
- Up to 255 independent software instrument channels
- Up to 255 auxiliary channel strips
- 64 busses
- 15 inserts, 8 sends per channel
- 32 multi-assignable channel groups for mix and edit
- Extensive control surface support with autolearn
- Support for active control surfaces via CS plug-ins
- Curve tool for refining automation
- Powerful automation features include:
  - Group automation recording
  - Linked editing of grouped automation
  - Automation Quick Access for easy hardware control of currently selected parameter
  - Automate any channel strip parameter or plug-in parameter on the fly or manually input parameter values using a breakpoint interface
  - View multiple automation parameters for a single track at once
  - Simultaneously view and edit automation for single or multiple tracks
  - Read, write, touch, and latch automation modes

### Included Instruments from Logic Studio

- Synthesizers
  - EFM1 (FM Synth)

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- ES E (Ensemble Synth)
  - ES M (Monophonic Synth)
  - ES P (Polyphonic Synth)
  - ES1 Synth (Analog Synth)
  - ES2 Synth (Subtractive Synth)
  - EVOC20 PS (Vocoder Synth)
- EXS24 Sampler
- Ultrabeat (Drum Synthesizer/Sampler/Sequencer) MO
- External Instrument plug-in
- Klopfeist (Metronome Sound Generator)
- Test Oscillator
- All 24 GarageBand instruments
  - Analog Basic
  - Analog Mono
  - Analog Pad
  - Analog Swirl
  - Analog Sync
  - Bass
  - Church Organ
  - Digital Basic
  - Digital Mono
  - Digital Stepper
  - Drum Kits
  - Electric Clav
  - Electric Piano
  - Guitar
  - Horns
  - Hybrid Basic
  - Hybrid Morph
  - Piano
  - Sound Effects
  - Strings
  - Tonewheel Organ
  - Tuned Percussion
  - Voice
  - Woodwind

## Included Effects from Logic Studio

- Amp Modeling
  - Bass Amp
  - Guitar Amp
- Delay
  - Echo
  - Sample Delay
  - Stereo Delay
  - Tape Delay
- Distortion
  - Bitcrusher
  - Clip Distortion
  - Distortion
  - Distortion II
  - Overdrive
  - Phase Distortion
- Dynamics
  - Compressor
  - DeEsser
  - Ducker
  - Enveloper
  - Expander
  - Limiter
  - Noise Gate
  - Preset Multipressor
  - Silver Compressor

- Silver Gate
- EQ
  - Channel EQ
  - DJ EQ
  - Fat EQ
  - High Cut
  - High Pass Filter
  - High Shelving EQ
  - Low Cut
  - Low Pass Filter
  - Low Shelving EQ
  - Parametric EQ
  - Silver EQ
- Filter
  - AutoFilter
  - EVOC 20 Filterbank
  - EVOC 20 TrackOscillator
  - Fuzz-Wah
  - Spectral Gate
- Imaging
  - Direction Mixer
  - Stereo Spread
- Metering
  - BPM Counter
  - Correlation Meter
  - Level Meter
  - Tuner
- Modulation
  - Chorus
  - Ensemble
  - Flanger
  - Microphaser
  - Modulation Delay
  - Phaser
  - Ringshifter
  - Rotor Cabinet
  - Scanner Vibrato
  - Spreader
  - Tremolo
- Pitch
  - Pitch Correction
  - Pitch Shifter II
  - Vocal Transformer
- Reverb
  - AVerb
  - EnVerb
  - GoldVerb
  - PlatinumVerb
  - SilverVerb
- Specialized
  - Denoiser
  - Enhance Timing
  - Exciter
  - Grooveshifter
  - Speech Enhancer
  - SubBass
- Utilities
  - Gain
  - I/O
  - Test Oscillator

# Apple Remote Desktop 3 - Technical Specifications

Apple Remote Desktop 3 - Part Numbers	
Unlimited Managed Systems	MB423Z/A
10 Managed Systems	MB422Z/A

## System Requirements

### Administration and Client Systems

- The administration and client system for Apple Remote Desktop 3 is designed to run on any computer running Mac OS X v10.3.9 or later.
- Automator Actions and Remote Desktop widget require Mac OS X v10.4 or later on administrator system.
- Remote Spotlight search requires Mac OS X v10.4 or later on client system.

### Network

- An Ethernet (recommended), IP over FireWire or AirPort network connection is required.

### In the Box

- Apple Remote Desktop 3 CD
- Electronic documentation
- Getting Started guide

## Universal

Stay compatible. Apple Remote Desktop 3 is a Universal application, which means it runs natively on both PowerPC- and Intel-based Mac computers.

## Asset Management

### Remote Spotlight search

- Search a remote computer, its startup disk, or a specific folder, qualified using one or more of these metadata keywords: Kind, Last Opened, Last Modified, Created, Keywords, Color, Label, Name, Contents, and Size — and filtered for specific text
- Results can be copied back to the administrator's computer, opened on remote computers, or deleted

### User History report

- Lists who has logged onto a computer, how and where they accessed it, and when they logged on and off

### Application Usage report

- Shows which applications have been used on remote systems, the number of launches, duration of the launch, and who executed the launch

### File Search report

- Search for files on groups of Mac OS X computers using name, parent path, full path, extension, date modified, date created, actual size, size on disk, kind, invisible, version number, version string, owner, group, permissions and locked status file attributes

### Software Version report

- Selects up to 10 applications and compares versions installed on Administrator computer with a group of Mac OS X computers

### Software Difference report

- Compares applications, fonts, and installed packages on Administrator computer with a group of Mac OS X computers

## System Overview

- Computer: Active Processors, Available User Memory, Boot ROM, Bus Clock Speed, Bus Data Size, CPU Speed, Serial Number, Vector Processor, L2 Cache Size, L3 Cache Size, Machine Model, Memory, Empty RAM Slots, PCI Slots Used, Processor Count, CPU Type, Sales Order Number, VM Size, Total RAM Slots
- Software: Kernel Version, System Version
- Storage: Free Disk Space, Total Disk Space, Trash Size



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- AirPort: AirPort Active, AirPort Firmware Version, AirPort Hardware Address, AirPort Locale, AirPort Type, AirPort Installed, AirPort Network Channel, AirPort Network in Range, Computer to Computer, AirPort Network Name
- Modem: Modem Country, Modem Driver, Modem Firmware Version, Modem Installed, Modem Interface, Modem Model
- Network: First Ethernet Address, NetBooted, Primary IP Address, Primary Network Collisions, Primary Network Flags, Primary Network Hardware Address, Primary Network Input Errors, Primary Network Input Packets, Primary Network Output Errors, Primary Network Output Packets, Primary Network
- Display: Monitor Type, Monitor Depth, Monitor Resolution, 2nd Monitor Type, 2nd Monitor Depth, 2nd Monitor Resolution
- Devices: ATA Device Count, Firewire Device Count, Keyboard Connected, Mouse Connected, Optical Drive Type, SCSI Device Count, USB Device Count
- AppleTalk: AppleTalk Active, AppleTalk Network, AppleTalk Node, AppleTalk Zone
- Sharing: Computer Name, File Sharing, FTP Access, Remote Apple Events, Remote Login, UNIX Hostname, Web Sharing, Windows Sharing
- Preferences: Sleep Display, Sleep Hard Disk, Sleep Computer, Wake for Ethernet Access
- Printing: Printer Name, Printer Sharing, Printer Type, Printer Version
- Remote Desktop: Computer Info #1, Computer Info #2, Computer Info #3, Computer Info #4
- Lights Out Management: LOM Active, LOM Channel, LOM IPv4 Configuration, LOM IPv4 Address, LOM Subnet Mask, LOM Gateway, LOM Ethernet ID

## Storage report

- Hardware: Drive Manufacturer, Drive Model, Drive Revision, Drive Protocol, Removable, Serial Number, Logical Unit Number, Detachable
- Volume: Creation Date, Disk Name, File Count, Folder Count, Total Disk Space, Free Space, Startup Disk, UNIX Mount Point
- File System: Disk Format, Owner, Group, Permission Modes, Permissions, Write Access, Modification Date, Case Sensitive, Preserves Case
- Backup: Journaling Capable, Journalled, Last Backup Date, Last Check Date

## FireWire Devices report

- Manufacturer, Model, Device Speed, Software Version, Firmware Version

## Network Interface report

- Network Overview: Name, Active, Primary, Configured with, Hardware Address, Interface Name, Flags
- Active Interface: Domain, Router Address, IP Address, Broadcast Address, DNS Server, Subnet Mask, IP Addresses, Broadcast Addresses, DNS Servers, Subnet Masks
- Network Statistics: Network Collisions, Network Input Errors, Network Input Packets, Network Output Errors, Network Output Packets
- Output Statistics: Output Queue Capacity, Output Queue Size, Output Queue Peak Size, Output Queue Drop Count, Output Queue Output Count, Output Queue Retry Count, Output Queue Stall Count
- Ethernet Statistics: Ethernet Alignment Errors, Ethernet FCS Errors, Ethernet Single Collision Frames, Ethernet Multiple Collision Frames, Ethernet SQE Test Errors, Ethernet Deferred Transmissions, Ethernet Late Collisions, Ethernet Excessive Collisions, Ethernet Internal MAC Transmit Errors, Ethernet Carrier Sense Errors, Ethernet Frames Too Long, Ethernet Internal MAC Receive Errors, Ethernet Chip Set, Ethernet Missed Frames, Ethernet Receiver Overruns, Ethernet Receiver Watchdog Timeouts, Ethernet Receiver Frames Too Short, Ethernet Receiver Collision Errors, Ethernet Receiver PHY Errors, Ethernet Receiver Timeouts, Ethernet Receiver Interrupts, Ethernet Receiver Resets, Ethernet Receiver Resource Errors, Ethernet Transmitter Underruns, Ethernet Transmitter Jabber Events, Ethernet Transmitter PHY Errors, Ethernet Transmitter Timeouts, Ethernet Transmitter Interrupts, Ethernet Transmitter Resets, Ethernet Transmitter Resource Errors, Ethernet Collision Frequencies

## PCI Card report

- Card Name, Card Type, Card Memory, Card Revision, Vendor ID, Device ID, ROM Version, Slot Name

## Memory report

- Slot Identifier, Module Size, Module Type, Module Speed

## USB Devices report

- Product Name, Vendor Name, Device Speed, Product ID, Vendor ID, Bus Power Amps

## Scheduling

- Schedule for specific date and time
- Set Mac OS X computers to rebuild and send data on their hardware and software settings on a regular schedule or only as needed

## Software Distribution

## Package installation

# 528\_Apple Remote Desktop 3 - Technical Specifications.pdf

- Install single or multiple packages remotely on a group of Mac OS X systems
- Install packages in .pkg and .mpkg formats
- Schedule for specific dates and times
- Detect whether a package requires a restart
- Restart computer upon completion of installation or at a later time
- Encrypt data stream
- Specify network bandwidth usage

## File Copy

- Copy single or multiple files and folders to a group of Mac OS X systems
- Copy single or multiple files and folders from a group of Mac OS X systems to administrator's computer
- Copy single or multiple files to predefined locations: same relative location, Applications folder, current user's Desktop folder, current user's home directory, Fonts folder, Preferences folder, System folder, top folder of the disk, or a specified path
- Schedule for specific dates and times
- Choose an action if an item already exists: ask what to do, replace the item, replace if existing item is older, rename the existing item, rename the item being copied
- Set the permissions of the file once copied: inherit from destination folder, preserve current owner or user, or specify user and group
- Encrypt data stream
- Specify network bandwidth usage

## Remote Assistance

### Observe and control screens of remote Mac computers

- Support for VNC-enabled computers, including Windows and Linux systems
- Drag and drop a file from one remote computer to another
- Use remote copy and paste to quickly transfer text or images
- Adjust color depth to one of four modes: black and white, grayscale, thousands of colors, millions of colors
- Scale screens to fit in current window when viewing larger screens
- Use Curtain Mode to block a user's view while configuring sensitive information
- Take complete control or share mouse and keyboard with remote user
- Toggle between full-screen mode and fit-in-window mode
- Take screen shots

### Observe and control multiple screens of remote Mac or VNC-enabled computers simultaneously

- View up to 50 screens in a single window
- Adjust the number of screens visible on each page
- Adjust color depth to one of four modes: black and white, grayscale, thousands of colors, millions of colors
- Rotate through the list of observed computers manually or automatically
- View at-a-glance information about network computers using system status indicators

### Screen sharing and text communication

- Share a Mac screen with other Mac OS X systems
- Send text message to a group of Mac OS X systems
- Conduct one-to-one real-time, computer-to-computer text chat

## Remote Administration

### Manage systems remotely

- Sleep and wake a group of Mac OS X systems
- Restart and shut down a group of Mac OS X systems, perform restart and shut down immediately or allow users to save work
- Power on one or more Mac OS X systems which feature Lights Out Management
- Open files and applications on a group of Mac OS X systems
- Empty Trash for all users on one or more Mac OS X systems
- Log out current user for one or more Mac OS X systems
- Upgrade Apple Remote Desktop Client software on a group of Mac OS X computers running earlier versions of Apple Remote Desktop Client software (v1.2 or later)

### Send UNIX commands to a group of Mac OS X systems.

- Execute commands as the current user or a specified user
- Set Network, Energy Saver, and Date & Time system preferences using command-line tools
- Use any of 30 sample UNIX scripts in the Task Template menu; add your own scripts

# 528\_Apple Remote Desktop 3 - Technical Specifications.pdf

## Set startup disk

- Set startup disk to local disk or partition, or select from a list of NetBoot or Network Install images
- Start up multiple computers remotely
- Optionally restart computers after setting new startup disk

## Rename Mac OS X computers

- Append a unique number for each computer when multiple computers are selected

## Change Apple Remote Desktop Client settings

- Change the Apple Remote Desktop Client settings for one or more Mac OS X systems
- Save as a package to apply to Mac OS X systems at a later date

## Automation

- Create powerful system administration workflows by combining Apple Remote Desktop actions
- Create end-to-end solutions by combining actions with other applications' actions
- Over 30 Automator actions
- Save Automator workflows as plug-ins

## Easy Setup

- Discover the computers you need to manage using network scanners. Create as many scanners as you need and configure each to search particular areas of your network
- Create computer lists to organize the system however you wish — by model, location, or department, for example
- Review or reuse tasks using list of previously executed tasks
- Allow non-administrator users to run Apple Remote Desktop 3 with some or all of features enabled
- Use a computer other than the administrator computer as a task server to automatically collect reporting data
- Define to organize groups by location, model, or department
- Define a set of rules to add computers to Smart Computer Lists automatically
- Associate computers with one of seven user-defined labels
- Use customized Computer List views to show only information of interest, including 14 additional attributes that may be chosen for display
- Authenticate clients using organization's directory services group names
- Encrypt all communications between Apple Remote Desktop 3 and client computers with 128-bit AES encryption, or disable encryption for data-intensive tasks

Published Date: Mar 8, 2017

# Mac OS X 10.5 Server - Technical Specifications

OS X 10.5 Server - Part Numbers	
Mac OS X Server 10-Client Edition	<b>MB005Z/A</b>
Mac OS X Server Unlimited-Client Edition	<b>MB004Z/A</b>
Mac OS X Server License Upgrade	<b>MB006Z/A</b>

## System Requirements

Mac server or desktop computer with an Intel, PowerPC G5, or PowerPC G4 (867MHz or faster) processor; 1GB of physical RAM; 20GB of available disk space.

### Podcast Producer requirements

- **Podcast Capture:** Requires a Mac running Mac OS X v10.5 or Mac OS X Server v10.5
- **Podcast Producer:** A Mac with an Intel processor running Mac OS X Server v.10.5, 1GB of RAM plus 512MB of RAM per core and a Quartz Extreme-enabled video chipset. For optimal performance, an Xsan clustered file services is recommended.

### Wiki Server requirements

Interacting with Wiki Server requires a modern web browser such as:

- Safari 3 (Mac OS X, Windows)
- Safari (iPhone, iPod touch)
- Internet Explorer 6 or 7
- Firefox 2

## Services

### File and Print Services

- Mac (AFP, AppleTalk PAP, IPP)
- Windows (SMB/CIFS, IPP)
- UNIX and Linux (NFS, LPR/LPD)
- Internet (FTP, WebDAV)

### Directory Services and Authentication

- Open Directory (OpenLDAP, Kerberos, SASL)
- NT Domain Services (Samba 3)
- Backup Domain Controller (BDC)
- LDAP directory connector
- Active Directory connector
- BSD configuration files (/etc)
- RADIUS

### Mail Services

- SMTP (Postfix)
- POP and IMAP (Cyrus)
- SSL/TLS encryption (OpenSSL)
- Mailing lists (Mailman)
- WebMail (SquirrelMail)
- Junk mail filtering (SpamAssassin)
- Virus detection (ClamAV)

### Calendaring

- iCal Server (CalDAV, iTIP, iMIP)

### Distributed Computing

- Xgrid 2

### File Systems

# 529\_Mac OS X 10.5 Server - Technical Specifications.pdf

- HFS+ (journaled, case sensitive)
- Read-only UFS and ZFS

## Web Hosting

- Apache web server (2.2 and 1.3)
- SSL/TLS (OpenSSL)
- WebDAV
- Perl (5.8.8), PHP (5.2), Ruby (1.8.6), Rails (1.2.3)
- MySQL 5
- Capistrano, Mongrel

## Collaboration Services

- Wiki Server (RSS)
- iChat Server 2 (Jabber/XMPP)

## Application Servers

- Apache Tomcat (6)
- Java virtual machine (J2SE)
- WebObjects Deployment (5.4)
- Apache Axis (SOAP)

## Client Management

- Managed Preferences
- NetBoot
- NetInstall
- Software Update Server
- Portable home directories

## Networking and VPN

- DNS server (BIND 9)
- DHCP server
- NAT server
- VPN server (L2TP/IPSec, PPTP)
- Firewall (IPFW2)
- NTP

## Management Features

- Server Assistant
- Server Admin
- Server Preferences
- Server Status widget
- Workgroup Manager
- System Image Utility
- Secure Shell (SSH2)
- Server Monitor
- RAID Utility
- SNMPv3 (Net-SNMP)

## High-Availability Features

- Automatic recovery
- File system journaling
- IP failover
- Software RAID
- Disk space monitor

## Media Streaming

- QuickTime Streaming Server 6
  - QuickTime Broadcaster 1.5
-

## What's in the box

- Installation DVD
- Admin Tools CD
- Printed getting started guide
- Electronic documentation

## Applications

- RAID Admin
- Server Admin
- Server Assistant
- Server Monitor
- Server Preferences
- System Preferences
- System Image Utility
- TextEdit
- Workgroup Manager
- Xgrid Admin

## Utilities

- Activity Monitor
- Automator
- Console
- Directory
- Directory Utility
- Disk Utility
- Network Utility
- ODBC Administrator
- Podcast Capture
- RAID Utility
- System Profiler
- Terminal
- X11

## Development

- Xcode
- Instruments

## Services

- AFP
- DHCP
- DNS
- Firewall
- FTP
- iCal Server
- iChat Server
- Mail
- MySQL
- NAT
- NetBoot and NetInstall
- NFS
- Open Directory
- Podcast Producer
- Print
- QuickTime Streaming
- RADIUS
- SMB
- Software Update
- VPN
- Web
- WebObjects
- Xgrid

## Languages

- English
- Japanese
- French
- German

## Key Technologies

- Apache
- AppleScript
- Bonjour
- CalDAV
- Carbon, Cocoa, Java
- CDSA
- Fibre Channel
- FireWire
- H.264
- HFS+
- IPv4 and IPv6
- IPFW
- Jabber/XMPP
- Kerberos
- L2TP/IPSec
- LDAP
- Perl
- PPTP
- Python
- Ruby on Rails
- Quartz Extreme
- QuickTime
- RAID
- 64-bit computing
- Samba
- SNMP
- Spotlight
- Tomcat
- Unicode 4
- UNIX
- USB
- VNC
- WebDAV
- Xgrid
- ZFS

Published Date: Jun 26, 2009

# Apple Cinema Display (20-inch) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Apple Cinema Display (20-inch) - Technical Specifications

Configurations			
Model	Apple Studio Display M7649ZM/B	Apple Cinema Display M8893ZM/A	Apple Cinema HD Display M8537ZM/A
Screen size and type	17-inch (viewable) active-matrix LCD	20-inch (viewable) active-matrix LCD	23-inch (viewable) active-matrix LCD
Maximum resolution	1280 by 1024 pixels	1680 by 1050 pixels	1920 by 1200 pixels
Viewing angle	170° horizontal; 170° vertical	170° horizontal; 170° vertical	170° horizontal; 170° vertical
Color support	16.7 million colors	16.7 million colors	16.7 million colors
Input/Output ports	Apple Display Connector; two-port, self-powered USB hub	Apple Display Connector; two-port, self-powered USB hub	Apple Display Connector; two-port, self-powered USB hub
Agency approvals	ENERGY STAR, TCO 95	ENERGY STAR, TCO 95	ENERGY STAR, TCO 95

System Requirements
<ul style="list-style-type: none"><li>■ The Apple Studio Display requires Mac OS X v10.1.3 or Mac OS 9.2.2 or later, and one of the following systems:<ul style="list-style-type: none"><li>—Power Mac G4 with an Apple Display Connector</li><li>—PowerBook G4 with a DVI port and an Apple DVI to ADC Adapter</li></ul></li><li>■ The Apple Cinema Display requires Mac OS X v10.2 or later, and one of the following systems:<ul style="list-style-type: none"><li>—Power Mac G4 with an NVIDIA GeForce2 MX, GeForce3, GeForce4 MX, or GeForce4 Titanium graphics card; or with an ATI Radeon 7500, 9000 Pro, or 9700 Pro graphics card</li><li>—PowerBook G4 with a DVI port and an Apple DVI to ADC Adapter</li></ul></li><li>■ The Apple Cinema HD Display requires Mac OS X v10.1.3 or Mac OS 9.2.2 or later, and one of the following systems:<ul style="list-style-type: none"><li>—Power Mac G4 with an NVIDIA GeForce2 MX, GeForce3, GeForce4 MX, or GeForce4 Titanium graphics card; or with an ATI Radeon 7500, 9000 Pro, or 9700 Pro graphics card</li><li>—PowerBook G4 with a DVI port and an Apple DVI to ADC Adapter</li></ul></li><li>■ A second Apple display can be used with a Power Mac G4 via the DVI port on the NVIDIA GeForce4 MX, GeForce4 Titanium, ATI Radeon 7500, Radeon 9000 Pro, or Radeon 9700 Pro graphics card and the Apple DVI to ADC Adapter.</li></ul>

## Technical Specifications



Screen size (diagonal viewable image size)

- Apple Studio Display: 17 inches
- Apple Cinema Display: 20 inches
- Apple Cinema HD Display: 23 inches

Screen type

- Thin film transistor (TFT) active-matrix liquid crystal display

Optimum resolutions

- Apple Studio Display: 1280 by 1024 pixels
- Apple Cinema Display: 1680 by 1050 pixels
- Apple Cinema HD Display: 1920 by 1200 pixels

Display colors (maximum)

- 16.7 million

Viewing angle (typical)

- 170° horizontal; 170° vertical

Brightness (typical)

- Apple Studio Display: 200 cd/m<sup>2</sup>
- Apple Cinema Display: 230 cd/m<sup>2</sup>
- Apple Cinema HD Display: 200 cd/m<sup>2</sup>

Contrast ratio (typical)

- 350:1

Pixel pitch

- Apple Studio Display: 0.264 mm
- Apple Cinema Display: 0.258 mm
- Apple Cinema HD Display: 0.258 mm

Screen treatment

- Antiglare hardcoat

User controls (hardware and software)

- System power on, sleep, wake
- Brightness
- Monitor tilt

Connectors and cables

- Apple Display Connector carries digital video, USB, and power
- Two-port, self-powered USB hub

Electrical requirements

- Input voltage: 24.5V to 28V DC carries digital video, USB, and power
- Maximum power when operating: 40W (Apple Studio Display); 60W (Apple Cinema Display); 70W (Apple Cinema HD Display)
- Energy saver mode: 3W or less

Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Operating humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet

Agency approvals

- FCC Part 15 Class B
- EN55022 Class B
- EN55024
- VCCI Class B
- AS/NZS 3548 Class B
- CNS 13438 Class B
- ICES-003 Class B
- ISO 13406
- MPR II
- IEC 60950
- UL 60950
- CSA 60950
- EN60950
- ENERGY STAR
- TCO 95

Size and weight

17-inch Apple Studio Display

- Height: 17.3 inches (43.9 cm)
- Width: 17.6 inches (44.7 cm)
- Depth: 6.9 inches (17.6 cm) minimum; 9.8 inches (24.9 cm) maximum
- Weight: 14.6 pounds (6.6 kg)

20-inch Apple Cinema Display

- Height: 17.3 inches (43.9 cm)
- Width: 21.34 inches (54.2 cm)
- Depth: 6.93 inches (17.6 cm) minimum; 10.43 inches (26.5 cm) maximum
- Weight: 18.9 pounds (8.6 kg)

23-inch Apple Cinema HD Display

- Height: 19.2 inches (48.8 cm)
- Width: 24.2 inches (61.4 cm)
- Depth: 7.3 inches (18.7 cm) minimum; 11.1 inches (28.0 cm) maximum
- Weight: 25.3 pounds (11.5 kg)

# Xsan 2 - Technical Specifications

Xsan 2 - Part Numbers	
Xsan 2	<b>MB081Z/A</b>
Apple Maintenance Program for Xsan	<b>D2977Z/A</b>
AppleCare Xsan Support	<b>M9754LL/A</b>

## System requirements

Mac OS X v10.5 or Mac OS X Server v10.5 or later, Intel or PowerPC G5 processor, at least 2GB of RAM and an additional 2GB for each hosted volume and Apple Fibre Channel card. For maximum performance, a dedicated Ethernet interface is recommended for file system metadata communications.

## Storage and networking requirements

Switched Ethernet LAN, qualified RAID storage system, and qualified Fibre Channel switch. For maximum performance, a dedicated Ethernet interface is recommended for file system metadata communications.

## Qualified RAID storage

Xserve RAID, Promise VTrak E-Class RAID Subsystem

## Qualified Fibre Channel switches

Brocade SilkWorm 200E, 4100, 4900; QLogic SANbox 2-64, 1400, 5200, 5600, 9100, and 9200 series; Cisco MDS 9000 family

## Xsan 2 - Technical Specifications

### SAN File Sharing

- 64-bit cluster file system
- Fibre Channel connectivity
- Concurrent read/write access
- Block-level access
- File and byte-range locking

### High Availability

- Metadata controller failover
- Fibre Channel multipathing
- Journaled file system
- Controller failover prioritization

### Performance

- Striping across multiple disk arrays (LUNs)
- Volume configuration profiles (high-definition and standard-definition video, file sharing, network home directories, iCal Server and Mail Server clustering, Podcast Producer)

### Volume Management

- Storage pools
- Striping across multiple LUNs
- Online volume expansion
- Volume mapping
- MultiSAN

### Data Management

- Affinities for automated data placement
- Open Directory, Active Directory, and LDAP integration
- User and group quotas

# 530\_Xsan 2 - Technical Specifications.pdf

- Flexible file permissions (access control lists)
- Spotlight indexing and search

## **Remote Administration**

- Xsan Admin 2 with SAN Setup assistant
- Real-time monitoring
- Graphs and logging
- Event notifications via email or pager

## **What's in the Box**

- Xsan 2 CD
- Setup Guide
- Electronic documentation

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# Logic Studio - Technical Specifications

Logic Studio - Part Numbers	
Retail	MA797LL/A
Upgrade from Pro, Platinum, Gold 5 or 6	MA800LL/A
Upgrade from Logic Express 6, 7, 8	MA801LL/A
Academic	MA802LL/A

## Additional Information

- [Logic Pro 8 - Technical Specifications](#)
- [Soundtrack Pro - Technical Specifications](#)
- [MainStage - Technical Specifications](#)

## Minimum Requirements to Install All Logic Studio Applications

- A Macintosh computer with a 1.25 gigahertz (GHz) or faster PowerPC G4, PowerPC G5, or Intel Core Duo or Xeon processor
- 1 Gigabyte (GB) of random-access memory (RAM)
- A display with 1024 x 768 resolution
- A DVD drive for installation
- Mac OS X v10.4.9 (or later)
- QuickTime 7.2 (or later)

## Logic Studio Recommendations

- A Macintosh PowerPC G5, or Intel Core Duo or Xeon processor
- 2 Gigabyte (GB) of random-access memory (RAM)
- A display with 1280 x 800 resolution

## Application-specific Recommendations:

### Logic Pro 8

- 2 to 4 Gigabyte (GB) of random-access memory (RAM) for large EXS instruments
- A PCI Express, ExpressCard/34, or FireWire based audio interface
- A MIDI interface and keyboard (or suitable USB device)

Note: The REX Shared Library © Propellerhead Software is required when using ReCycle files within Logic Pro. More information on ReCycle files can be found at: <http://www.propellerheads.se>.

### Logic Node

- Logic Node requires a Macintosh computer with a G5 or Intel Core processor

### MainStage

- 2 to 4 Gigabyte (GB) of random-access memory (RAM) for large EXS instruments
- Standard graphics card found in any Mac Pro, MacBook Pro, iMac Intel Core Duo, Power Mac G5, or iMac G5

## Surround Requirements for Logic Pro and Soundtrack Pro

- A Macintosh computer with a dual PowerPC G5 (or CoreDuo or Xeon) processor for surround productions
- Multichannel audio interface

## Available Disk Space

You can freely choose which components of the Logic Studio package should be installed. Please see the installer for further information on the disk space requirements of individual applications, templates, loops, and content. You can freely choose the installation location for the larger content packages.

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# Logic Pro 8 - Technical Specifications

## Additional Information

- [Logic Studio - Technical Specifications](#)
- [Soundtrack Pro 2 - Technical Specifications](#)
- [MainStage - Technical Specifications](#)

## Minimum requirements to install all applications

- Mac computer with a 1.25GHz or faster PowerPC G4 processor (PowerPC G5, Intel Core Duo, or Intel Xeon processor highly recommended)
- 1GB of RAM (2GB or more highly recommended)
- Display with 1024-by-768 resolution (1280-by-800 or higher recommended)
- Mac OS X v10.4.9 or later
- QuickTime 7.2 or later
- DVD drive for installation
- PCI Express, ExpressCard/34, USB, or FireWire based audio interface recommended

## Additional recommendations for Logic Pro

- At least 2GB of RAM for large EXS instruments
- USB musical keyboard (or suitable MIDI keyboard and interface) for instruments
- Logic Node requires a Mac computer with a PowerPC G5, Intel Core, or Intel Xeon processor and Gigabit Ethernet

## Surround requirements for Logic Pro and Soundtrack Pro

- Mac computer with dual PowerPC G5 processors or an Intel Core Duo or Xeon processor
- Multichannel audio interface

## Available disk space

- 7GB to install all applications and required content
- Additional 39GB to install all optional content (large content packages can be installed on separate disk):
  - 10GB for Jam Pack collections
  - 16GB for sound effects
  - 6GB for surround music beds
  - 7GB for other optional content

## Contents

- DVD containing Logic Pro 8, MainStage, Soundtrack Pro 2, Studio Instruments, Studio Effects, WaveBurner 1.5, Compressor 3, Impulse Response Utility, Apple Loops Utility, QuickTime 7 Pro, and required content
- Six content DVDs containing Jam Pack collections, sound effects, surround music beds, EXS24 samples, and impulse response files
- Demo content DVD
- Printed and electronic documentation

## Streamlined Interface

- Unified window design consolidates multiple edit and browser areas
- Library browser makes it easy to find audio files, channel strip settings, and plug-in settings
- Inspector provides convenient access to region and track parameters as well as primary mix functions via the innovative Dual Channel Strip
- Assign tools to mouse and view current assignments directly in the Arrange window
- Simple multiple track creation and setup
- Customizable tool and transport bars
- Context-sensitive shortcut menus
- Definable startup behavior
- Enhanced plug-in headers for all instruments and effects
- Global Tracks for graphical editing of key and time signatures, markers, tempo, and transposition
- Selectable time- and/or beat-based bar ruler for time-linear and/or beat-linear display in the Arrange window
- Waveform zoom slider for improved visibility of low-level signals
- Extensive zoom tools and functions

## Ultimate Writing Studio

- Extensive MIDI composition
  - Region-based quantize, transpose, gate, swing, and velocity control

## 533\_Logic Pro 8 - Technical Specifications.pdf

- MIDI Groove templates
- Creative MIDI processing and routing in the Environment
- Caps Lock Keyboard for note entry using computer keyboard
- Custom and Hermode tuning
- MIDI step entry
- Full support for Apple Loops
  - Apple Loops browser for finding and previewing loops based on tempo, key, style, and mood
  - Export of MIDI and audio regions as Apple Loops
  - Edit plug-ins and MIDI performances for Software Instrument loops
  - Independent loop transposition
  - Comprehensive loop tagging and editing with Apple Loops Utility
- Complete music notation
  - Real-time transcription
  - Instrument transposition
  - Guitar tablature
  - Drum notation
  - Chord symbols
  - Adaptive lyric input
  - Automatic multibar rests
  - Comprehensive palette of slurs, crescendos, and other ornaments
  - Staff Styles for easy recall of multiple stave attributes
  - Score Sets allow instruments to be combined for editing and print
  - Layout and printing of complete professional scores
- Robust video playback features
  - Embedded or floating video window display
  - Digital Cinema Desktop for display of full-screen video on second monitor
  - External video output via FireWire or DVCPRO HD
  - Global video thumbnail track
  - Scene detect option to mark video transitions automatically
- Fast and intuitive region looping
- Global chord track with automatic chord recognition

### Production Powerhouse

- Over 980 definable key and MIDI commands
- 90 recallable screen configurations
- Audio file and I/O resolution up to 24-bit/192kHz
- Internal audio resolution: 32-bit floating point; 64-bit precision where required
- Comprehensive surround support up to 7.1, with flexible surround mixing facilities
- Extended project length: 6 hours at 96kHz; 13 hours at 44.1kHz
- .Mac backup and sharing of preferences and settings
- Use of an Apple Remote to control Logic Pro 8 from a distance, with the ability to play, stop, record, rewind, fast-forward, and move to the next or previous track
- High-end POW-r dithering algorithm
- Seamless punch-on-the-fly recording
- Low latency mode to remove plug-in induced latency during recording
- Graphic beat mapping for creating tempo maps from existing audio
- Well-designed collection of production-ready templates
- Multiple documents open at once
- Bounce to AIFF, WAV (Broadcast Wave), CAF, SDII, MP3, M4A (Apple Lossless, AAC)
- Fast, offline bouncing of single or multiple tracks
- Burn any bounced audio directly to CD or DVD-A (PCM only)
- Master and author professional, Red Book-standard CDs with WaveBurner, included in Logic Studio
- Asset management simplifies consolidation and transport of projects and their dependent assets
- MIDI note extraction from audio for drum replacement and melodic transcription
- Freeze Tracks feature releases CPU resources by invisibly rendering tracks
- Distributed audio processing (DAP) aggregates processing power of multiple computers on a network
- Serial-based copy protection
- Powerful folders to facilitate organization and streamline various arranging tasks

### Extreme Compatibility

- Open GarageBand songs directly in Logic Pro
- Support for Apple Core Audio and Digidesign DAE/TDM hardware (To use Logic Pro 8 with your TDM System, you will need at least Pro Tools HD 7.3 or higher for PPC. Use of Logic Pro 8 with Pro Tools on a MacPro system will be available in an upcoming release of Pro Tools.)

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- Support for TDM and AudioSuite plug-ins with DAE/TDM hardware
- Support for Audio Units plug-ins
- Support for AAF, OMF, Open TL, and XML (Final Cut Pro)
- Streamlined ReWire support for optimized integration with Reason, Ableton Live, and other ReWire-compatible applications

## Precision Editing

- Intuitive region-based MIDI and audio editing
- Comprehensive set of editing tools assignable to left, right, and key-modified mouse buttons
- Effortless take management:
  - Region-based take recording and management in automatically generated take folders
  - Pack existing tracks into take folders
  - Single-click take selection
  - Colorize takes on the fly
  - Intelligent unpacking of take folders onto separate tracks
  - Move and edit entire take folders like any other region
- Revolutionary Quick Swipe Comping
  - Build a comp track from multiple takes
  - Create comps on the fly
  - Audition comps in real time
  - Automatic, customizable crossfades between phrases
  - Flatten function replaces take folder with regions that represent the current comp
  - Flatten and Merge function replaces take folder with newly created audio file
- Multiple MIDI editors:
  - Piano Roll
  - Score
  - Hyper
  - Event List
  - Transform
- Graphical time stretching and compression in the Arrange window
- Sample-accurate editing in the Arrange window
- Definable relative or absolute snap grid
- Nondestructive graphical fades and crossfades
- Snap-to-transient selection
- Shuffle and Auto-Crossfade Arrange Edit modes
- Destructive sample editing using built-in or external sample editor like Soundtrack Pro 2
- 10,000-step undo history
- Time-linear and/or beat-linear display in the Arrange window

## Professional Mixing and Automation

- Track Mixer views simplify mixer channel navigation
- Dynamic channel strip creation accelerates mixer setup and configuration
- Easy setup of multi-output software instruments
- Signal Flow view option shows all channel strips (e.g., Aux, Output, Master) within the audio signal path of the selected channel strip
- Save/Load complete plug-in configurations using channel strip settings
- Sample-accurate, track-based 32-bit automation
- Track- or region-based solo and mute
- Track mute/solo in either Fast or CPU-Saving mode
- Solo safe mode for any channel strip
- Direct insert patching of external hardware instruments and effects
- Exponential or dB-linear level meter scaling
- Busses as sources for recording
- Inline input monitoring
- Up to 255 independent mono, stereo, or surround audio channels
- Up to 255 independent software instrument channels
- Up to 255 auxiliary channel strips
- 64 busses
- 15 inserts, 8 sends per channel
- 32 multi-assignable channel groups for mix and edit
- Extensive control surface support with autolearn
- EuCon protocol support for Euphonix MC and System-5-MC control surface systems
- Support for Smart AV Smart Console
- Support for active control surfaces via CS plug-ins
- Curve tool for refining automation
- Powerful automation features include:

# 533\_Logic Pro 8 - Technical Specifications.pdf

- Group automation recording
- Linked editing of grouped automation
- Automation Quick Access for easy hardware control of currently selected parameter
- Automate any channel strip parameter or plug-in parameter on the fly or manually input parameter values using a breakpoint interface
- View multiple automation parameters for a single track at once
- Simultaneously view and edit automation for single or multiple tracks
- Read, write, touch, and latch automation modes

## **Comprehensive Surround**

- Support for all standard surround configurations, including LCRS, Quad, 5.1, 6.1, and 7.1
- Support for multichannel interleaved and split surround audio files
- Play back, record, or process multichannel interleaved audio files
- Surround level metering
- Multichannel signal routing via sends, busses, and auxiliaries
- Graphic Surround Panner to manipulate mono or stereo streams within a surround field
- Graphic Surround Balancer to simultaneously balance all channels of surround input
- Support for Logic Studio True Surround plug-ins
- Built in multi-mono support lets you use any mono or stereo Logic Studio or Audio Units plug-in in a surround project
- Surround bounce and burn to DVD-A (PCM only) disc
- Dolby Digital AC-3 encoding and preview with Compressor
- Easy mixdown to stereo and surround formats using Down Mixer plug-in

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# Final Cut Studio 2: Final Cut Pro 6 - Technical Specifications

Final Cut Studio 2 - Part Numbers	
Retail	MA886Z/A
Upgrade from Final Cut Pro	MA887Z/A
Academic	MA886Z/A

## Additional Information

- [Final Cut Studio 2 - Technical Specifications](#)

## Minimum Requirements to Install All Final Cut Studio Applications

- A Macintosh computer with a 1.25GHz or faster PowerPC G4, PowerPC G5, Intel Core Duo, or Intel Xeon processor
- 1GB of RAM
- An AGP or PCI Express Quartz Extreme graphics card (Final Cut Studio is not compatible with integrated Intel graphics processors)
- A display with 1024-by-768 resolution or higher
- Mac OS X v10.4.9 or Mac OS X v10.5.5 or later
- QuickTime 7.1.6 or later
- A DVD drive for installation

## Available Disk Space

- 4GB of disk space required to install all applications (Final Cut Pro, Color, DVD Studio Pro, Soundtrack Pro, Motion, Cinema Tools, LiveType, Compressor, and Apple Qmaster)
- Additional 55GB required to install all optional templates, content, and tutorials (may be installed on separate disks):
- 9GB for DVD Studio Pro content
- 8GB for Motion templates and tutorial media
- 24GB for Soundtrack Pro audio content
- 12GB for LiveFonts and LiveType animated elements and templates
- 2GB for Apple Pro Training Final Cut Studio Tutorials media

## Recommended Configurations

### The following are recommended for all applications:

- 2GB of RAM when working with compressed HD and uncompressed SD sources
- 4GB of RAM when working with uncompressed HD sources
- A display with 1280 x 1024 resolution or higher
- 4 GB of hard disc space is required to install all of the Final Cut Studio 2 applications
- An additional 55 GB of hard disc space is required to install all optional templates, content, and tutorials (may be installed on separate discs):
- 9 GB for DVD Studio Pro content
- 8 GB for Motion templates and tutorial media
- 24 GB for Soundtrack Pro audio content
- 12 GB for LiveFonts and LiveType animated elements and templates
- 2 GB for Apple Pro Training Final Cut Studio Tutorials media

## Final Cut Pro 6 - Technical Specifications

### Editing and Timeline

- Mix frame sizes, frame rates, and formats in the same Timeline in real time

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- Edit at 23.976, true 24, 25, 29.97, 30, 50, or 60 fps
- Multicam editing of up to 128 sources with real-time playback of up to 16 angles
- Source/Record three-point editing model
- Insert and overwrite with or without transitions
- Replace, fit to fill, and superimpose edits
- Edit overlay for drag-and-drop editing
- Blade and Blade All tools for adding edits
- Extend and split edits
- Sync indicators in Timeline
- Adjacent (through edit) indicators in Timeline
- Dupe detection in Timeline
- Keyframe graphs
- Track targeting
- Track locking
- Auto Select tools

## Trimming

- Ripple
- Roll
- Slip and slide
- Lift and ripple delete
- Asymmetric, multitrack trimming
- Dynamic trimming
- JKL trimming
- Trim window
- Timeline trimming
- Keyboard and numeric trimming

## Effects

- FxPlug support
- Real-time software-based audio normalization
- RT Extreme for scalable software-based, multistream real-time effects in DV, SD, and HD formats
- Real-time effects playback on main display and on NTSC/PAL or HD monitor with perfect synchronization
- Dynamic RT for automatically adjusting playback quality and/or frame rate based on hardware capabilities
- Motion integration for motion graphics work
- Shake integration for visual effects work
- 8-bit, 10-bit, and HDR (32-bit floating point) image processing
- Time Remap tool
- Keyframe graphs and editing in Viewer or Timeline
- More than 200 transitions, effects, and filters
- Unlimited effects favorites
- Copy and paste motion and effect attributes
- Unlimited layers with support for nesting
- Bezier curves with movable motion paths
- Numeric control and keyframe capabilities for precise animation and effects
- 2D and 3D titles with Boris Calligraphy
- Animated titles, lower thirds, and graphics with LiveType
- Composite and transfer modes
- Import multilayered Photoshop files with layers and alpha support
- Support for many third-party After Effects plug-ins (PowerPC only)
- FXScript and FXBuilder for designing custom filters and effects
- Digital Cinema Desktop for real-time SD and HD preview playback on an attached Apple Cinema Display

## Tools

- High-quality real-time video vectorscopes and waveform monitors
- Multitrack Audio Mixer
- Keyboard and user interface customization tool

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- Voice Over tool for adding narration directly to Timeline
- Frame Viewer for shot comparisons
- Source timecode overlays in Viewer and Canvas
- QuickView for RAM-based previews of complex multilayered sequences

## LiveType

- LiveFonts animated fonts
- Customizable text effects and project templates
- Royalty-free animated content library
- Keyframe animation
- Real-time wireframe preview
- Canvas RAM preview
- Import wide variety of formats
- Resolution independent and scalable
- Individual character control
- Unicode system font support
- Animation for rolls and crawls
- Type on a curve
- FontMaker utility for creating custom LiveFonts

## Audio

- Subframe audio keyframing to 1/100th of a frame
- Real-time audio filter adjustments during playback
- Multichannel audio with support for up to 24 channels in and out
- OMF audio export
- Onscreen multitrack mixing console
- External control surface support
- Soundtrack Pro integration for audio mixing and sound design
- Real-time fader automation
- Variable keyframe thinning
- Real-time audio filters and effects
- Sampling at 8kHz to 96kHz and 8 to 24 bits
- Audio level meters (per track)
- Mac OS X Audio Units plug-in support
- Pan controls
- Mute and solo controls
- Audio waveform display in Timeline
- Logarithmic audio fades
- Scrubbing with or without pitch shifting
- More than 25 audio filters

## Color Correction

- Send to Color
- Primary (three-way) color corrector
- Secondary (two-way) color corrector
- Image control filters
- 4- and 8-point garbage mattes
- Real-time, hardware-accurate waveform monitor and vectorscopes
- Broadcast-safe filter
- Range-checking zebra stripe overlays

## Application

- Full Unicode support
- Dynamic window resizing

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- Mode-free interface for workflow efficiency
- Multiple sequences and projects open simultaneously
- Up to 99 levels of undo
- 99 audio and 99 video tracks with support for nesting sequences together
- System and user preferences
- Easy Setups for quick configuration
- Customizable keyboard
- Customizable real-time effects settings
- Customizable render settings
- Customizable window arrangements
- Customizable user interface buttons
- Customizable Browser layouts
- Customizable track layouts
- External editor support (helper applications)
- Create Support Profile command for improved AppleCare support

## Film

- Cinema Tools 4 included
- Create PDF and export XML film lists
- Include timecode and keycode in the same list
- Support for 35mm 3-perf, 35mm 4-perf, and 16mm-20
- Comprehensive, integrated film management tools
- View feet and frames in Timeline
- View keycode and ink number overlays on video in Final Cut Pro
- Film data information in Final Cut Pro Browser
- 24-fps EDL I/O
- 24-fps EDL conversion to and from 29.97 fps
- Import ALE, ATN, FLX, and FTL files in both Cinema Tools and Final Cut Pro
- Track key numbers, ink numbers, video and audio timecode
- Output the following lists:
  - Cut list
  - Change list
  - Optical list
  - Pull list
  - Dupe list
  - Missing elements list
  - Audio EDL
- Link media to database
- Synchronize database with Final Cut Pro
- View film data directly in Final Cut Pro
- Search and sort
- Poster frame capability
- Conform clips to specified frame rate
- Reverse telecine function in either Cinema Tools or Final Cut Pro
- Export ALE files
- Import and export Final Cut Pro batch lists

## Supported Formats and I/O\*

- Apple ProRes 422 and Apple ProRes 422 (HQ), an 8- or 10-bit, full-resolution VBR format that supports all major frame sizes and frame rates at target bit rates of 145 Mbps and 220 Mbps
- 5.1 surround sound monitoring
- Broadcast Wave Format with drop and non-drop frame timecode options
- Native editing for DV, DVCAM, DVCPRO, DVCPRO 50, and DVCPRO HD
- Native long GOP MPEG-2 editing for HDV, including 1080i 50/60, 1080p 24/25/30, 720p 24/25/30/50/60
- Native long GOP MPEG-2 editing for XDCAM EX at 720p 24/25/30/50/60, 1080i 50/60, 1080p 24/25/30
- AVCHD and AVC-Intra editing support using ProRes (requires a Mac computer with an Intel processor)
- Support for XDCAM HD at 1080i 50/60/VFR and 1080p 24/25/30/VFR with free Sony software
- Support for Sony XDCAM HD 422 1080i 50/60, 1080p 24/25/30, 720p 50/60
- Native 25-Mbps CBR, 18- and 35-Mbps VBR MPEG HD for XDCAM HD

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- Native editing for IMX at 30, 40, and 50 Mbps for SD
- Native editing for P2 at 1080i 50/60/VFR and 720p 24/24N/25/25N/30/VFR from P2 cards
- 1080pA 24 (Advanced Pulldown) supported via FireWire from AJ-HD1200A and AJ-HD1400
- P2 import dialog with browse, mark, and background ingest
- IMX ingest and output supported with optional third-party software
- Uncompressed 8- and 10-bit HD (4:2:2 YUV) via PCI card
- Uncompressed 8- and 10-bit SD (4:2:2 YUV) via FireWire or a PCI card
- Apple Intermediate Codec
- OfflineRT Photo-JPEG codec
- HD at 1080i 50/60, 1080p 23.98/24/25, and 720p 24/25/30/50/60
- Pulldown tools for telecine insertion and removal
- 25 fps @24 fps conversion
- Frame-accurate log and captures
- Frame-accurate edit-to-tape
- Serial device control (RS-422, RS-232)
- FireWire device control
- Log and capture tool with support for batch, clip, and on-the-fly capturing
- Still images: PSD, BMP, JPEG, PICT, PNG, SGI, TARGA, TIFF
- Insert and assemble editing to tape
- Compressor for encoding, format conversions, and batch processing

## Media Management

- Export OMF with volume and pan metadata
- Media management tools
- Render file manager
- Extensive search, sort, and sift capabilities in Browser
- Rename Clips to match Media and vice versa
- Maintain Master clips across multiple projects
- Clip labels
- Custom comment fields
- Integrated film database with Cinema Tools 4
- Master and affiliate clips
- Move, copy, and transcode items at sequence or project level
- Consolidate, trim, or archive
- Online with automatic reconnect and batch capture capabilities
- EDL I/O
- Autosave Vault
- XML interchange format for custom integration work
- Batch export
- Compressor integration

\*Some features require additional hardware. Capturing HD resolution video using the ProRes 422 format requires a Mac Pro with an Intel Xeon processor or a G5 Quad computer and a qualified third-party capture card. DV, DVCPRO 50, and DVCPRO HD output requires a FireWire-enabled camera or deck. SD output via FireWire requires an AJA Io. Please contact your Apple Authorized Reseller for information.

1. Copy protection requires that you output your project to a replicator. Macrovision requires that users work with a Macrovision-certified replication facility or execute a Macrovision usage agreement. Check with your replicator for costs and minimum quantities

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# Final Cut Studio 2 - Technical Specifications

Final Cut Studio 2 - Part Numbers	
Retail	MA886Z/A
Upgrade from Final Cut Studio	MA888Z/A
Upgrade from Final Cut Pro	MA887Z/A
Academic	MA886Z/A

## Additional Information

- [Final Cut Pro 6 - Technical Specifications](#)
- [DVD Studio Pro 4.2 - Technical Specifications](#)
- [Motion 3 - Technical Specifications](#)
- [Compressor 3 - Technical Specifications](#)
- [Soundtrack Pro 2.0 - Technical Specifications](#)
- [Color 1.0 - Technical Specifications](#)

## Minimum Requirements to Install All Final Cut Studio Applications

- A Macintosh computer with a 1.25GHz or faster PowerPC G4, PowerPC G5, Intel Core Duo, or Intel Xeon processor
- 1GB of RAM
- An AGP or PCI Express Quartz Extreme graphics card (Final Cut Studio is not compatible with integrated Intel graphics processors)
- A display with 1024-by-768 resolution or higher
- Mac OS X v10.4.9 or Mac OS X v10.5.5 or later
- QuickTime 7.1.6 or later
- A DVD drive for installation

## Available Disk Space

- 4GB of disk space required to install all applications (Final Cut Pro, Color, DVD Studio Pro, Soundtrack Pro, Motion, Cinema Tools, LiveType, Compressor, and Apple Qmaster)
- Additional 55GB required to install all optional templates, content, and tutorials (may be installed on separate disks):
- 9GB for DVD Studio Pro content
- 8GB for Motion templates and tutorial media
- 24GB for Soundtrack Pro audio content
- 12GB for LiveFonts and LiveType animated elements and templates
- 2GB for Apple Pro Training Final Cut Studio Tutorials media

## Recommended Configurations

### The following are recommended for all applications:

- 2GB of RAM when working with compressed HD and uncompressed SD sources
- 4GB of RAM when working with uncompressed HD sources
- A display with 1280 x 1024 resolution or higher
- 4 GB of hard disc space is required to install all of the Final Cut Studio 2 applications
- An additional 55 GB of hard disc space is required to install all optional templates, content, and tutorials (may be installed on separate discs):
- 9 GB for DVD Studio Pro content
- 8 GB for Motion templates and tutorial media
- 24 GB for Soundtrack Pro audio content
- 12 GB for LiveFonts and LiveType animated elements and templates
- 2 GB for Apple Pro Training Final Cut Studio Tutorials media

## Soundtrack 2 - Specific Requirements

- For 5.1. surround monitoring of multichannel audio content: an audio interface with a minimum of six outputs
- for multitrack recording: an audio interface with multiple inputs

## Motion - Specific Requirements

- A standard or built-to-order system configuration with a NVIDIA GeForce 5200, FX Go5200, FX 5200 Ultra, 6600, 6600 LE, 6800, 7300, 7300 GT, 7800, 7600 GT, 8600, 8800 or Quadro class graphics card.
- A standard or built-to-order system configuration with a ATI Radeon 9800, 9700, 9600Pro, 9600XT, 9700Pro, X800, X1600, X1900, or X2600 class graphics card; or a ATI Mobility Radeon 9700 or 9600 graphics card.
- For 16- and 32-bit rendering: a graphics card with at least 128MB of VRAM.

## Motion-Configuration Recommendations

- One of the following graphics cards is highly recommended:
  - ATI Radeon C1900 XT, X800 XT, or X1600
  - NVIDIA GeForce 7800 GT, 6800 Ultra DDL, 6800 GT DDL, or Quadro FX 4500
- For 32-bit rendering: a graphics card with 256 MB of VRAM or more

## Color - Specific Requirements

- The standard graphics card in any Mac Pro, 17-inch MacBook Pro, 24-inch iMac, or 2.5GHZ or faster Power Mac G5 Quad:
  - ATI Mobility Radeon X1600
  - ATI Radeon X1600
  - NVIDIA GeForce 7800 GT, 7600 GT, 7300 GT, 6800 Ultra DDL, 6800 GT DDL, 660, or Quadro FX 4500.
- For 32-bit rendering: a graphics card with at least 256MB of VRAM.
- A display with 1680-by-1050 resolution or higher (excluding 20" iMac); dual displays are highly recommended.
- A three-button mouse for full functionality

## Color-Configuration Recommendations

- ATI Radeon C1900 XT graphics card
- Dual Displays with 1920 x 1200 or higher resolution

## DVD Studio Pro - Specific Requirements

- For playback of DVD Studio Pro 4-authored HD DVDs: a Macintosh computer with a PowerPC G5 or Intel Core Duo processor
- For writing finished projects to disc: an Apple SuperDrive or other DVD recorder
- For writing finished projects to a double-layer disc: a double-layer-compatible recorder and double-layer media
- For transporting HD projects to a replicator: an external drive or Internet transfer of the project's disk image
- For transporting SD projects that contain copy-protection or dual-layer features to a replicator: a DLT drive, external drive, or Internet transfer of the project's disk image

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# Final Cut Express 4 - Technical Specifications

Final Cut Express 4 - Part Numbers	
Retail	<b>MB278Z/A</b>
Upgrade from Final Cut Pro	<b>MA339Z/A</b>
Academic	<b>MB279Z/A</b>

## Minimum Hardware Requirements to Install All Final Cut Express Applications

- A Mac computer with a 1.25GHz or faster PowerPC G4, PowerPC G5, Intel Core Duo, Intel Core 2 Duo, or Intel Xeon processor
- For AVCHD: A Mac computer with an Intel processor
- 500MB of disk space to install Final Cut Express and LiveType
- Additional 500MB to install LiveType content
- 1GB of RAM or more
- An AGP or PCI Express graphics card compatible with Quartz Extreme; or an Intel GMA integrated graphics processor in a MacBook or Mac mini computer
- Some FxPlug filters are not compatible with integrated Intel graphics processors.
- A display with 1024-by-768 resolution or higher
- A DVD drive for installation

## Minimum Software Requirements

- Mac OS X v10.4.10 or later
- QuickTime 7.2 or later

## Universal Applications

- Final Cut Express 4 and LiveType 2.1 are Universal applications; they run on both PowerPC- and Intel-based Mac computers.

## Input and Capture

- Plug-and-play support for most DV25-format camcorders and decks: MiniDV and DVCAM (NTSC or PAL)
- Plug-and-play support for most HDV-format camcorders and decks: 720p, 1080i
- Plug-and-play support for most AVCHD-format camcorders and decks: 720p, 1080i\*
- FireWire device control of most FireWire-equipped MiniDV camcorders from such leading manufacturers as Sony, Canon, Panasonic, and JVC
- Capture window for naming, adding comments to, and organizing clips as they are captured
- Log and Transfer window for naming, adding comments to, organizing, and transferring AVCHD clips
- Incremental clip naming during capture when a recording break is discovered
- Still image importing for PSD, BMP, JPEG, PICT, PNG, SGI, TARGA, and TIFF formats
- iMovie '08 file import with cuts and dissolve transitions
- Bins for project file and sequence organization
- Clip organization in the Browser using extensive search and sort capabilities
- Clip labels for organizing and sorting clips
- Master and affiliate clip relationship for automatic update of certain properties of a clip, such as clip name or reel name, within the current project
- Up to 32 levels of undo

## Editing and Timeline

- Mix DV (NTSC and PAL) and HD formats in the same Timeline
- Nondestructive editing references original video to prevent alteration of source footage
- Editing palette for most-used functions, enabling one-click, pro-style edits
- Drag-and-drop editing
- Editing in the Timeline
- Three-point editing model
- 99 video tracks with support for nesting sequences
- Support for multiple sequences and projects for creating alternative edits or breaking projects into smaller pieces
- Insert and overwrite with or without transitions
- Replace, fit to fill, and superimpose edits



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- Blade and Blade All tools for adding edit points to sequences
- Extend and split edits for additional editing options
- Sync detection and correction to compensate for audio and video tracks that slip out of sync
- Active track targeting for specifying individual or multiple tracks to apply edits or protect from editing
- Auto Select controls of specific tracks in the Timeline for track content selection via In and Out points in the Timeline or Canvas
- Keyframe graphs
- Track locking
- Timecode or frames in the Timeline
- Clip, sequence, scoring, chapter, and compression markers
- Clip and sequence marker export to LiveType for titling
- Chapter marker export to iDVD
- Custom, independent track heights
- Autosave Vault for saving projects at specified intervals to prevent accidental loss

## Trimming

- Ripple, roll, slip, and slide
- Asymmetric, multitrack trimming
- Dynamic JKL trimming
- Trim Edit window
- Timeline trimming
- Keyboard and numeric trimming

## Output

- Print to Video command for recording a sequence or clip back to DV or HDV device
- Footage looping for multiple outputs on the same tape
- Sequence, scoring, chapter, and compression markers
- Marker export to DVD Studio Pro for chapter and compression settings
- Project export using any QuickTime file format, including MPEG-4, for distribution via email or the web
- Digital Cinema Desktop for full-screen, real-time preview playback

## Streamlined Workflow

- Full Unicode support
- Dynamic window resizing
- Mode-free interface for workflow efficiency
- Simultaneous opening of multiple sequences and projects
- 99 audio and 99 video tracks with support for nesting tracks together
- System and user preferences
- Easy Setups for quick configuration
- Customizable real-time effects settings
- Customizable render settings
- Customizable window arrangements
- Customizable user interface buttons
- Customizable Browser layouts
- Customizable track layouts
- Custom, independent track heights in the Timeline

## Media Management

- Extensive search and sort capabilities in the Browser
- Clip labels
- Custom comment fields
- Master and affiliate clips
- Move, copy, and transcode capability at sequence or project level
- Autosave Vault

## Transitions, Filters, and Effects

- More than 200 transitions, filters, and effects
- Unlimited effects favorites
- Over 50 new FxPlug filters and effects from Final Cut Pro
- Support for third-party FxPlug filters and effects
- Copy and paste capability for motion and effect attributes

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- Bezier curves for motion paths
- Keyframe control of all effects and filters for precise results
- Precision numeric controls for effects and animation
- RT Extreme for scalable, software-based, multistream real-time effects
- Safe and Unlimited RT Extreme modes for customizing performance versus quality tradeoffs
- RT Extreme quality settings: low, medium, high. Low setting for maximum simultaneous real-time streams and effects; high setting for full-resolution output for finishing directly to DV or HDV device
- Dynamic RT for automatic adjustment of image quality and frame rate on the fly, optimizing playback, and scaling performance as processor power increases
- Opacity overlays in the Timeline for adjustable, keyframable opacity
- Direct-to-Timeline drag-and-drop integration of Motion projects
- Auto Render option
- Broadcast-safe filter
- 2D and 3D titles with Boris Calligraphy
- Composite and transfer modes

## Titling

- Standard and scrolling text generators for creating titles that crawl, scroll, or appear in the lower third of the screen
- Option to combine titles with other filters, effects, and compositing for unlimited creative expression
- Boris Calligraphy plug-ins for 2D and 3D titles
- Non-Latin alphabet characters and symbols with full Unicode support

## LiveType 2.1

- Animated title and motion graphics creation
- Unicode system font support
- 500MB of royalty-free animated content, including over 50 background textures and objects
- Sophisticated project templates
- More than 200 customizable text effects
- Keyframe animation
- Real-time wireframe preview
- Canvas RAM preview
- Import capability for a wide variety of formats
- Independent and scalable resolution
- Dynamic individual character control
- Animation for rolls and crawls
- Type on a curve capability
- FontMaker utility for creating custom LiveFonts
- Drag-and-drop integration to Final Cut Express 4 Timeline with auto-updating

## Compositing

- Nesting for virtually unlimited compositing layers for complex video effects
- Adobe Photoshop file import, complete with layers for effects and motion graphics
- Bezier curves with movable motion paths for animation application and control
- Ease in/Ease out motion paths for smooth compositing animations
- Time effects, including slow motion with frame blending, for smooth, time-altered playback
- Accurate subpixel interpolation rendering for smooth, high-quality effects creation
- Composite modes including multiply and lighten
- Flicker filter for incorporation of still frames from video

## Color Correction

- Secondary (two-way) color corrector
- Image control filters
- Broadcast-safe filter
- Correction for flesh tones and other key elements
- Color mixing for visual style
- Footage matching from different sources for consistency
- Error correction in color balance and exposure

## Audio

- Up to 99 total audio tracks per sequence

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- More than 25 audio filters, including three-band and parameter equalizer, compressor/limiter, 60/120Hz hum remover, and noise gate for soundtrack quality control
- New Soft Normalize and Gain filter
- Real-time fader automation
- Real-time audio filters and effects
- Real-time audio filter adjustments during playback
- Subframe audio keyframing to 1/100th of a frame
- Sampling at 8kHz to 48kHz and 8 to 24 bits
- Audio level meters
- Mac OS X Audio Units plug-in support
- Pan controls
- Mute and solo controls
- Audio waveform display in the Timeline
- Logarithmic audio fades
- Scrubbing with or without pitch shifting
- Voice Over tool for adding narration directly to the Timeline
- Audio level overlays viewable in the Timeline
- No re-rendering required when muted tracks are reactivated

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# MainStage 2 - Technical Specifications

## Additional Information

- [Logic Studio - Technical Specifications](#)
- [Logic Pro 8 - Technical Specifications](#)
- [Soundtrack Pro 2 - Technical Specifications](#)

## Minimum requirements to install all applications

- Mac computer with a 1.25GHz or faster PowerPC G4 processor (PowerPC G5, Intel Core Duo, or Intel Xeon processor highly recommended)
- 1GB of RAM (2GB or more highly recommended)
- Display with 1024-by-768 resolution (1280-by-800 or higher recommended)
- Mac OS X v10.4.9 or later
- QuickTime 7.2 or later
- DVD drive for installation
- PCI Express, ExpressCard/34, USB, or FireWire based audio interface recommended

## Additional recommendations for MainStage

- At least 2GB of RAM for large EXS instruments
- USB musical keyboard, control surface, or guitar pedal board (or suitable MIDI control device and interface)
- Standard graphics card in any Mac Pro, MacBook Pro, iMac with Intel Core Duo, Power Mac G5, or iMac G5

## Available disk space

- 7GB to install all applications and required content
- Additional 39GB to install all optional content (large content packages can be installed on separate disk):
  - 10GB for Jam Pack collections
  - 16GB for sound effects
  - 6GB for surround music beds
  - 7GB for other optional content

## Contents

- DVD containing Logic Pro 8, MainStage, Soundtrack Pro 2, Studio Instruments, Studio Effects, WaveBurner 1.5, Compressor 3, Impulse Response Utility, Apple Loops Utility, QuickTime 7 Pro, and required content
- Six content DVDs containing Jam Pack collections, sound effects, surround music beds, EXS24 samples, and impulse response files
- Demo content DVD
- Printed and electronic documentation

## Revolutionary Interface

- Full-screen performance view optimized for the stage
- Windowed performance view for simultaneous operation of multiple applications
- High-resolution, resizable 3D graphics
- Dynamic lighting highlights screen controls in use

## Sounds for the Stage

- Perform using the entire selection of Studio Instruments
- Process audio using all appropriate effect plug-ins from Studio Effects
- Audio Units support for all third-party plug-ins
- Up to 32 total keyboard layers per Patch, with up to 8 layers per split
- Floating keyboard splits that dynamically adjust during a performance
- Channel strip setting crossfades for blending between sounds with a single controller move
- Busses for advanced audio routing, submixing, and effects processing
- Signal Flow view displays all channel strips within a selected audio signal path
- Full-screen software tuner for guitars and basses
- Tap tempo using any MIDI or USB controller device or your computer keyboard
- Receive tempo from incoming MIDI clock messages
- Professional templates featuring extensive combinations of instruments and effects
- Seamless patch switching during performance without disrupting sound output or held notes
- Patch selection via MIDI program change messages
- CPU, MIDI input, and memory displays embedded in the MainStage toolbar

# 537\_MainStage 2 - Technical Specifications.pdf

## Hardware Integration

- Hardware compatibility with any MIDI or USB controller
- Automatic device detection for many popular controller devices
- Automatic controller assignments for recognized devices
- Layouts to assign controllers to specific parameters, then reassign controllers when equipment changes
- Learn function for fast assignment of MIDI hardware

## Performance Customization

- Save and load full performance setups in the form of Concerts
- Organize sections of your performance by grouping Patches into Sets within Concerts
- Import and export Sets, Patches, and Layouts to customize Concerts
- Concert-level or Patch-level parameter mapping
- Parameter mapping via browser or direct selection from the plug-in interface
- Load and save channel strip settings for use in MainStage and Logic Pro
- Browser for searching and loading channel strip settings
- Contextual Inspectors that provide editing options according to mode and object selected
- Customizable Patch icons
- Resize, group, lock, and color functions for screen controls
- Customizable toolbar
- Keyboard transposition
- Velocity range and velocity offset options on a per-channel strip basis
- MIDI controller transformations:
  - Expression Scaling
  - Modulation
  - MIDI Volume
  - Breath Control
- MIDI message filtering on a per-channel strip basis:
  - Pitch Bend
  - Modulation
  - Aftertouch
  - Sustain
  - Expression
- Broad range of customizable screen controls, including the following:
  - Keyboard
  - Mod/Pitch Wheel
  - Sustain Pedal
  - Foot Pedal
  - Foot Switch
  - Round Knob
  - Directional Knob
  - Vertical Fader
  - Horizontal Fader
  - Button
  - Drum Pad
  - Meter
  - Parameter Text Box
  - Free Text Box
  - Patch/Set Selector
  - Image Box

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# Logic Studio: Soundtrack Pro 2.0 - Technical Specifications

## Additional Information

- [Logic Studio - Technical Specifications](#)
- [Logic Pro 8 - Technical Specifications](#)
- [MainStage - Technical Specifications](#)

## Minimum requirements to install all applications

- Mac computer with a 1.25GHz or faster PowerPC G4 processor (PowerPC G5, Intel Core Duo, or Intel Xeon processor highly recommended)
- 1GB of RAM (2GB or more highly recommended)
- Display with 1024-by-768 resolution (1280-by-800 or higher recommended)
- Mac OS X v10.4.11 or later
- QuickTime 7.3 or later
- DVD drive for installation
- PCI Express, ExpressCard/34, USB, or FireWire based audio interface recommended

## Surround requirements for Logic Pro and Soundtrack Pro

- Mac computer with dual PowerPC G5 processors or an Intel Core Duo or Xeon processor
- Multichannel audio interface

## Available disk space

- 7GB to install all applications and required content
- Additional 39GB to install all optional content (large content packages can be installed on separate disk):
  - 10GB for Jam Pack collections
  - 16GB for sound effects
  - 6GB for surround music beds
  - 7GB for other optional content

## Contents

- DVD containing Logic Pro 8, MainStage, Soundtrack Pro 2, Studio Instruments, Studio Effects, WaveBurner 1.5, Compressor 3, Impulse Response Utility, Apple Loops Utility, QuickTime 7 Pro, and required content
- Six content DVDs containing Jam Pack collections, sound effects, surround music beds, EXS24 samples, and impulse response files
- Demo content DVD
- Printed and electronic documentation

## Precise Audio Control

- Nondestructive, sample-accurate editing of audio files
- Support for up to 24-channel files, including mono, stereo, and surround
- Action-based editing to modify, reorder, suspend, or delete any audio edit, plug-in, or process
- Audio Effects and Audio Units plug-ins can be applied to supported audio files as Actions
- Audio Effects and Audio Units plug-ins can be applied to supported audio files as real-time effect chains
- Real-time effects applied to audio files can be rendered to Actions
- Intelligent analysis, repair, and restoration functions for:
  - Clicks and pops
  - Power line hum
  - DC offset
  - Phase
  - Clipped signal
- Integrated multichannel file editor
- Audio time stretching without affecting pitch
- Ambient Noise Print to quickly replace unwanted noises from location recordings
- Background Noise Removal including noise print
- Sample ruler units in sample value, normalized, percent, and decibel view
- Snapping to ruler ticks, zero crossings, markers, and adjacent clips
- Support for bit depths up to 32-bit float

# 538\_Logix Studio- Soundtrack Pro 2.0 - Technical Specifications.pdf

- Support for sample rates from 2kHz to 192kHz
- Support for AIFF, WAV, MP3, CAF, BWF, SDII, NeXT, QuickTime, and STAP (Soundtrack Audio Project) file playback
- Saves files nondestructively as STAP files or destructively as AIFF, WAV, SDII, QuickTime, CAF, or NeXT
- Export mixes as AIFF, WAV, NeXT, SDII, MP3, AAC/Podcast, Dolby Digital Professional (AC-3), or using Compressor
- Selection history
- Waveform and customizable frequency spectrum views with linear and logarithmic display
- Frequency selection and editing in frequency spectrum view
- Animated waveform feedback
- Mini-waveform view

## Advanced Sound Design

- Processes including:
  - Fade in/Fade out
  - Normalize
  - Amplitude adjust
  - Silence
  - Invert
  - Swap channels
  - Mono conversion
  - Channel reordering
  - Resample
  - Generate silence, white noise, pink noise, sine wave, sawtooth wave, square wave, or triangle wave
- Support for Audio Units plug-ins
- Audio Units presets available to all Audio Units-compatible applications
- More than 6000 sound effects, music beds, and music loops, including over 1000 in surround
- Powerful media search engine
- Support for Apple Loops, AIFF, WAV, MP3, AAC, CAF, and ACID sound and music libraries

## Professional Multitrack Audio Editing

- Single window with customizable tab panes
- Customizable window layouts
- Dynamic tab panes with quick show/hide functionality
- Resizable video window tab
- Multitrack Timeline with tracks, busses, submixes, and master in stereo or surround
- Multiple multitrack and audio file projects open at once
- Mixed sample rates supported in multitrack projects
- Time- or beat-based tracks
- Ruler in HH:MM:SS, seconds, samples, frames, drop frame, non-drop frame, beats
- Loop clip transposition
- Loop clip speed adjustments (quadruple, double, normal, half, quarter)
- Adjustable automatic and manual crossfades
- Fade selector for customizing fade in, fade out, and crossfades
- Tape-style and sample repeat scrubbing
- Rolling edit tool
- Native and custom timecode spotting
- Multitrack recording of mono, stereo, and multichannel files
- Lift & Stamp tool to selectively copy plug-in sets from one clip to another
- Lift & Stamp effect sets can be saved as presets
- Lift & Stamp EQ matches the EQ characteristics of one clip to another
- Automation parameters can move with clips or lock to absolute time
- Pull up/pull down of audio and video to all common standards
- Customizable clip and track colors
- Clip locking in multitrack
- Clip disabling in multitrack
- Momentary mono switch
- Automatable master tempo, master volume, master effects, and key
- Automation of most mix and effect parameters with read, touch, and latch modes
- Pre- and post-fader send busses for application of common effect plug-ins to multiple tracks
- Output bussing for single fader control of multiple tracks
- Support for multichannel audio output devices
- Time, duration, podcast, beat, and end-of-project markers
- Powerful browser for locating content quickly

# 538\_Logica Studio- Soundtrack Pro 2.0 - Technical Specifications.pdf

- Multipoint Video HUD
- Tool HUD
- Timecode HUD
- Numeric Clip offset
- Bin with access to multiple projects, media files, markers, and clips
- Spotlight-style searching in Bin

## Advanced Take Management

- Multitake recording with take editing in Multitake Editor
- Multitake Editor allows comps of multitake recordings and other audio files
- Combine individual phrases from different takes
- Automatic, customizable crossfade between phrases
- Single-click take selection
- Adjustable transition boundaries for multitake comps
- Final comp functions as stand-alone clip while retaining access to all takes
- Slide phrases within edit boundaries

## Surround and Stereo Mixing

- Discrete 5.1 mixing, bussing, and routing
- Console-style mixer with full stereo and surround meters on every track, bus, submix, and master
- Surround panning of mono, stereo, and surround audio files
- Mono, stereo, and surround files can be combined on same track
- Support for multichannel surround files
- Surround Panner HUD with automatable controls for rotation, width, collapse, center bias, LFE balance, and individual speaker disabling
- Surround and stereo panner automation data simultaneously available on each track
- Automatic surround to stereo fold-down option
- Support for True Surround and multi-mono effects
- Control surface support (Mackie Control Protocol)

## Integrated Workflow

- AppleScript scriptable (executable from Soundtrack Pro, Final Cut Pro 6, or as AppleScript droplets for batch processing)
- Automator actions for creation of complex multiapplication workflows in Mac OS X v10.4 or later
- Support for video formats up to HD resolutions
- Integrated video tab
- Output to SD and HD1 video monitors (via FireWire or PCI card)
- HD1 or SD output using Digital Cinema Desktop2 to second Apple Cinema Display
- Send and receive MIDI timecode and beat clock for synchronization with hardware and software
- Integration with Final Cut Pro 6, DVD Studio Pro 4, and Motion 3
- Round-trip audio file editing with Final Cut Pro 6 and Motion 3
- Support for Final Cut Pro 6 scoring markers
- Conform tab to conform audio edit to new Final Cut Pro 6 edits
- Conform visual interface for highlighting changed areas
- Accept or reject changes across entire project or selectively on a change-by-change basis
- Podcast track to create audio-only, enhanced, or video podcasts
- Support for chapter, artwork, and URL markers on video and audio podcasts
- Export presets and customizable post-export scripts
- OMF import
- AAF import and export

1. HD requires a Power Mac with 1GHz or faster single or dual processors and 1GB of RAM or any Intel-based Mac with a minimum of 1GB of RAM.

2. Digital Cinema Desktop requires a dual-port AGP card with second display.

Published Date: Jun 29, 2009



# Apple Cinema Display ADC - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Apple Cinema Display ADC - Technical Specifications

Configurations	Apple Cinema Display ADC
Model	M8058
Screen Size (diagonal viewable image size)	22 inches
Screen type	Thin film transistor (TFT) active-matrix liquid crystal display (AMLCD)
Resolutions	<ul style="list-style-type: none"><li>■ 1280 x 800 (native resolution)</li><li>■ 1024 x 640</li><li>■ 800 x 512</li><li>■ 800 x 500</li></ul>
Display colors (maximum)	16.7 million
Brightness (typical)	180 (candelas per meter squared)
Contrast ratio (typical)	300:1
User controls (hardware and software)	Power, Brightness, Contrast
Display connector	ADC
Serial (USB or ADB) connectors:	2 USB 1.1 ports (on back of display)
System requirements	Minimum Mac hardware: Power Mac G4 with ADC port
Power	<ul style="list-style-type: none"><li>■ Maximum: 77W</li><li>■ Energy Saver Mode: 35W</li></ul>

Published Date: Apr 6, 2016

# MacBook Pro (13-inch, Mid 2009) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

- Height:  
0.95 inch (2.41 cm)
- Width:  
12.78 inches (32.5 cm)
- Depth:  
8.94 inches (22.7 cm)
- Weight:  
4.5 pounds (2.04 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- One FireWire 800 port (up to 800 Mbps)
- Mini DisplayPort
- Two USB 2.0 ports (up to 480 Mbps)
- SD card slot
- Audio in/out
- Kensington lock slot

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone
- Combined optical digital output/headphone out (user-selectable analog audio line in)
- Supports Apple Stereo Headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free internal cables
- Reduced packaging volume
- Meets ENERGY STAR Version 5.0 requirements
- Rated EPEAT Gold

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	2.26 GHz	2.53 GHz	2.26 GHz	2.53 GHz
Idle	2.6	2.6	12	12

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	2.26 GHz	2.53 GHz	2.26 GHz	2.53 GHz
Hard drive accessing	2.6	2.6	11	11
CD drive accessing	3.2	3.2	23	24

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- Built-in iSight camera
- Mini DisplayPort

## Pure digital video output

**DVI output** using Mini DisplayPort to DVI Adapter (optional)

**VGA output** using Mini DisplayPort to VGA Adapter (optional)

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)

## Input

- Built-in full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports two-finger scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.26GHz or 2.53GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) or 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 memory; two SO-DIMM slots support up to 8GB

## Storage

- 160GB or 250GB 5400-rpm Serial ATA hard drive; optional 320GB or 500GB 5400-rpm hard drive, or 128GB or 256GB solid-state drive<sup>4</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>5</sup>

- Built-in 60-watt-hour lithium-polymer battery
- 60W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

# 541\_MacBook Pro (13-inch, Mid 2009) - Technical Specifications.pdf

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

- MacBook Pro
- Display cleaning cloth
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Install/restore DVDs
- Printed and electronic documentation

## Software

- Mac OS X v10.5 Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## 13-inch Configurations

	2.26GHz MacBook Pro (MB990LL/A)	2.53GHz MacBook Pro (MB991LL/A)
Enclosure	Precision aluminum unibody	
Processor	2.26GHz Intel Core 2 Duo	2.53GHz Intel Core 2 Duo
L2 cache	3MB shared	
System bus	1066MHz	
Memory	2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 8GB	4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 8GB
Hard drive <sup>4</sup>	160GB Serial ATA; 5400 rpm	250GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
Graphics	NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>	
Video	Built-in iSight camera; Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI (requires adapters, sold separately)	
Display	13.3-inch (diagonal) LED-backlit glossy widescreen display, 1280-by-800 resolution	
Expansion	One FireWire 800 port (up to 800 Mbps), two USB 2.0 ports (up to 480 Mbps), SD card slot	
Audio	Built-in stereo speakers, built-in omnidirectional microphone, combined optical digital output/headphone out with selectable analog audio line in	
Networking	Built-in 10/100/1000BASE-T (Gigabit) Ethernet	
Wireless	Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification) <sup>2</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate) module	
Hardware accessories	60W MagSafe Power Adapter, AC wall plug, power cord	
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
Apple and the global environment	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 500GB or 1TB server-grade hard drive
- Wi-Fi Certified for 802.11n draft 2.0
- USB port for connecting a USB printer or USB external hard drive

### Configure to order

- 250GB (5400-rpm) hard drive
- 320GB (5400-rpm) hard drive
- 500GB (5400-rpm) hard drive
- 128GB solid-state drive
- 256GB solid-state drive
- Up to 8GB of 1066MHz DDR3 SDRAM
- Apple Remote
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan
- Aperture
- Final Cut Express
- Logic Express
- iWork '09

### Accessories

- Apple LED Cinema Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Apple Wireless Mighty Mouse
- Apple Keyboard with Numeric Keypad
- Apple Wired Mighty Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. 1GB=1 billion bytes; actual formatted capacity less.
  5. Testing conducted by Apple in May 2009 using preproduction 2.53GHz Intel Core 2 Duo-based MacBook Pro units. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Apr 6, 2016

# Final Cut Studio 2: Motion 3 - Technical Specifications

Final Cut Studio 2 - Part Numbers	
Retail	MA886Z/A
Upgrade from Final Cut Pro	MA887Z/A
Academic	MA886Z/A

**Additional Information**

- [Final Cut Studio 2 - Technical Specifications](#)

## Minimum Requirements to Install All Final Cut Studio Applications

- A Macintosh computer with a 1.25GHz or faster PowerPC G4, PowerPC G5, Intel Core Duo, or Intel Xeon processor
- 1GB of RAM
- An AGP or PCI Express Quartz Extreme graphics card (Final Cut Studio is not compatible with integrated Intel graphics processors)
- A display with 1024-by-768 resolution or higher
- Mac OS X v10.4.9 or Mac OS X v10.5.5 or later
- QuickTime 7.1.6 or later
- A DVD drive for installation

## Available Disk Space

- 4GB of disk space required to install all applications (Final Cut Pro, Color, DVD Studio Pro, Soundtrack Pro, Motion, Cinema Tools, LiveType, Compressor, and Apple Qmaster)
- Additional 55GB required to install all optional templates, content, and tutorials (may be installed on separate disks):
- 9GB for DVD Studio Pro content
- 8GB for Motion templates and tutorial media
- 24GB for Soundtrack Pro audio content
- 12GB for LiveFonts and LiveType animated elements and templates
- 2GB for Apple Pro Training Final Cut Studio Tutorials media

## Recommended Configurations

### The following are recommended for all applications:

- 2GB of RAM when working with compressed HD and uncompressed SD sources
- 4GB of RAM when working with uncompressed HD sources
- A display with 1280 x 1024 resolution or higher
- 4 GB of hard disc space is required to install all of the Final Cut Studio 2 applications
- An additional 55 GB of hard disc space is required to install all optional templates, content, and tutorials (may be installed on separate discs):
- 9 GB for DVD Studio Pro content
- 8 GB for Motion templates and tutorial media
- 24 GB for Soundtrack Pro audio content
- 12 GB for LiveFonts and LiveType animated elements and templates
- 2 GB for Apple Pro Training Final Cut Studio Tutorials media

## Motion-Specific Requirements

- A standard or built-to-order system configuration with a NVIDIA GeForce 5200, FX Go5200, FX 5200 Ultra, 6600, 6600 LE, 6800, 7300, 7300 GT, 7800, 7600 GT, 8600, 8800 or Quadro class graphics card.
- A standard or built-to-order system configuration with a ATI Radeon 9800, 9700, 9600Pro, 9600XT, 9700Pro, X800, X1600, X1900, or X2600 class graphics card; or a ATI Mobility Radeon 9700 or 9600 graphics card.
- For 16- and 32-bit rendering: a graphics card with at least 128MB of VRAM.

## Motion-Configuration Recommendations

- One of the following graphics cards is highly recommended:
  - ATI Radeon C1900 XT, X800 XT, or X1600
  - NVIDIA GeForce 7800 GT, 6800 Ultra DDL, 6800 GT DDL, or Quadro FX 4500
- For 32-bit rendering: a graphics card with 256 MB of VRAM or more

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processor or a G5 Quad computer and a qualified third-party capture card. DV, DVCPRO 50, and DVCPRO HD output requires a FireWire-enabled camera or deck. SD output via FireWire requires an AJA Io. Please contact your Apple Authorized Reseller for information.

## Motion 3

### User Interface

- Unlimited tracks of movie clips, graphics, text, and particles
- Project sizes up to 4K (4K resolution requires a graphics card with 256MB of VRAM or more)
- Color bits-per-channel: 8-bit, 16-bit float, and 32-bit float (Float processing requires a graphics card with 128MB of VRAM; 256MB or more recommended)
- Customizable nonsquare-pixel support
- Semitransparent heads-up display with onscreen controls for layers, behaviors, and filters
- Onscreen controls for 3D position, 3D rotation, 3D anchor point, skew, four corner pin, and crop
- Enable/Disable float bit-depth viewing independent of project setting
- View color channels and alpha channels independently
- Canvas alignment tools including dynamic alignment guides, 3D grid, and rulers
- Pen-and-tablet gesture-based interface
- Integrated File Browser for fast access to Finder content
- RAM Previews for viewing complex animations at full frame rate
- Save favorite settings, customized effects, gradients, text styles, and more in the Library
- Over 1000 pieces of Apple-designed, royalty-free vector artwork, high-resolution images, and animated design elements
- Instantly display and access all layers in the project using a single keystroke, similar to Exposé in Mac OS X
- Customizable toolbar that places your favorite tools at your fingertips
- Create, save, and remap custom keyboard shortcuts
- Show images outside the visible frame boundary for easily adjusting off-screen objects
- Automatically collect media used in a project for easy backup or moving to other locations
- Use Spotlight in Mac OS X to locate Motion projects by searching on any layer name or text string created in the project

### 3D Compositing Environment

- Position, rotate, and intersect multiple layers in 3D space
- Combine multiple layers into 3D groups for hierarchical 3D animations
- Add, animate, and cut between multiple cameras
- Unique Walk-Camera intuitively operates like a first-person video game
- Adjust the camera's near and far soft clipping planes to avoid object "popping"
- Apply Camera behaviors for easily creating and modifying complex camera moves
- Quad split view for displaying multiple orthographic and perspective views
- Inset viewer for quickly checking alternative views while making adjustments
- Multiple light sources including ambient, directional, point, and spot
- Enable particles, Replicator elements, and paint strokes to animate in 3D space
- Create 3D text behaviors for character-by-character animations with full 3D position and rotation control
- Create 3D motion paths for layers, cameras, and light sources
- Apply behaviors like throw, orbit, and vortex with 3D attributes
- Isolate any layer to a Front view for easily modifying masks or editing text

### Timeline Editing and Layering

- Layer list view makes it easy to change the stacking order of any layer, group, filter, or animation behavior
- Grouping for applying compound transformations and filters
- Common "bring to front" and "send to back" functions
- Opacity and blend mode display for quick access on every layer and group
- Create drop zones for easy drag-and-drop image replacement
- Clone layers for linking instances of images that inherit properties automatically
- Solo tracks for easier viewing and refinements
- Composite with premultiplied or non-premultiplied alpha channels
- Mini-Timeline built into the Canvas that displays a single track for the currently selected layer, group, filter, or behavior
- Trim, slip, slide, and retine audio and video clips via the mini-Timeline
- Retine clips using frame blending, motion blur blending, or optical flow



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- Cache optical flow retiming analysis to change speed at any time without reanalyzing
- Full Timeline with drag-and-drop editing to choose between compositing and assembling multiple clips
- Insert and overwrite editing directly into the Timeline
- Display and edit audio tracks in the Timeline or in the Audio Editor
- Markers that can be placed in the Timeline or on a specific clip with notes

## Animation

- Unique behavior animations for creating natural phenomena like wind, gravity, and vortex
- Sophisticated simulations like attract, repel, and orbit, which create multilayered 3D animations
- Text sequencing for automating complex title animations in 3D space
- Auto-animated Parameter control like oscillate, wiggle, and more
- Retiming behaviors automate ramping in and out of speed changes
- Audio behavior for syncing animations with audio tracks
- MIDI behavior for triggering parameter changes via any MIDI device
- Shape behaviors allow for tracking points on a shape or creating random wiggling animated shapes
- Complete keyframe-based animation tools
- Keyframe Editor with Bezier, Linear, Constant, and Ease In/Ease Out interpolations
- Copy and paste keyframes from different tracks and parameters
- Keyframe settings for ping pong, repeat, and progressive
- Record Animation feature with keyframe thinning for recording animations in real-time
- Draw keyframes in the Keyframe Editor using freehand pen tool
- Squish, stretch, and move groups of keyframes using a transform box
- Save curve sets for quick access to common parameters
- View animated curves for easier navigation
- View keyframes in the Timeline for quick positioning
- Enable/Disable keyframe and behavior-based animations to easily compare different results

## Particle Engine

- Sprite-based particle engine with accelerated performance
- Over 200 particle presets for easy access to sparkles, fire, smoke, and more
- Animate particles in 3D space with "Face-Camera" control
- Apply multiple objects or video clips as emitters
- Apply additive blend mode for intense glowing results
- Animate emitters and cells independently
- Save newly created particles in the Library for reuse in other projects
- Choose between point, line, rectangle, circle, box, sphere, and more for emitter shapes
- Control birth rate, life, speed, angle, spin, scale, and gradient colors for particle cells
- Scale particles over their life or add behaviors like orbit and vortex for amazing 3D results with little effort

## Paint Effects

- Paint with pressure-sensitive vector-based brush strokes
- Select from over 100 customizable brush styles from traditional to abstract
- Modify brush width, color, opacity, jitter over the stroke path
- Automatically draw on and draw off with full customization
- Edit brush strokes as Bezier or advanced B-spline paths
- Rotate the stroke in 3D space with "Face-Camera" control for volumetric 3D strokes
- Assign pressure and speed to brush properties when using a pen and tablet
- Enable dynamics on paint dabs for particle paint type effects
- Apply Replicator-like sequencing animations that can cause the paint stroke to ripple through 3D space

## Replicator Tool

- Automatic replication of any graphic, text object, or movie file along defined patterns
- Over 200 Replicator presets that can be completely customized and resaved
- Animate replicated patterns in 3D space with "Face-Camera" control

# 542\_Final Cut Studio 2- Motion 3 - Technical Specifications.pdf

- Save newly created Replicators in the Library for reuse in other projects
- Choose between line, rectangle, circle, burst, spiral, wave, box, sphere, and more for Replicator patterns
- Define the number of rows, columns, and 3D ranks that fill or outline the pattern
- Control pattern size, cell size, angle, scale, and gradient colors for Replicator cells
- Change the offset for rows and columns, causing them to shift position across the defined pattern
- Control origin of animation from various points of the pattern
- Add random scale and angle setting for more natural replications
- Apply additive blend mode for intense glowing results
- Set color of replicated objects from a single tint to a user-defined range
- Add Replicator Sequence behavior for wavelike animations over various patterns

## Title Design

- Vector-based text engine for creating clean type at any size
- Format text using size, rotation, slant, tracking, kerning, and more
- Animate individual text characters in 3D space using customizable text behaviors
- Select from common set of blend modes, including normal, multiply, screen, and add
- Customize text styles with control over the face, outline, glow, and drop shadow
- Type-on and text on a path layout/animation options
- Text field in Inspector that makes it easy to edit text even if text is obscured in the Canvas
- Fill text with solid or multipoint gradients
- Apply static images or video clips as textures to text faces
- Control textures using hold frame, offset, wrap modes, and opacity
- Support for Asian, Cyrillic, and other Unicode system fonts
- Support for Apple LiveFonts for unique font animations

## Tracking and Stabilization

- Match move using single-point tracking or four corner pinning
- Create tracking data that can be referenced by multiple objects
- Track a filter's onscreen position controls
- Offset tracking for creating a single track from multiple offsets
- Tracking behavior highlights best potential tracking points, eliminating guesswork
- Advanced tracking algorithm maintains accurate analysis when patterns rotate or skew
- Smart retry resets search region automatically for less user intervention
- Provide directional hints for fast-moving regions by using Look-ahead feature
- Stabilize using traditional point stabilizer or optical flow analysis
- Automated optical flow stabilizer bypasses selecting points and time-consuming setup
- SmoothCam optical flow analysis removes jitter and rocking from handheld shots while retaining overall camera moves
- Adjust amount of smoothing applied to transforms, rotation, and scaling in real time

## Accelerated Filters and Effects

- Over 130 accelerated filters for real-time interactivity
- More than 10 blur filters, including Gaussian, Channel Blur, Radial Blur, and Defocus
- Simple and bevel borders
- More than 15 color correction filters, including Color Balance, Gradient Colorize, Color Reduce, and Threshold
- More than 25 distortion filters, including Basic 3D, Refraction, Insect Eye, Glass Distortion, Ripple, and Scrape
- Stunning glow effects for Light Rays, Bloom, Aura, and more
- PrimatteRT chroma keyer
- Stylize filters like Vignette, Color Emboss, Half Tone, Line Art, and Tunnel
- Unique kaleidoscope and tiling filters
- Time-based filters for echo and strobe effects
- Video filters for deinterlacing and broadcast-safe colors and luminance
- Generators that automatically generate patterns, noise, colors, and caustics
- Support for GPU-accelerated third-party FxPlug filters

## Masking Tools

# 542\_Final Cut Studio 2- Motion 3 - Technical Specifications.pdf

- Bezier or advanced B-spline masking tools
- Create ovals, rectangles, and arbitrary freehand shapes
- Control opacity and edge feathering
- Combine masks using mathematical operations
- Track entire shapes or control points using tracking behaviors
- Create image masks from alpha, luminance, or RGB values of a second image

## Audio

- Support for AIFF, WAV, MP3, VBR MP3, and AAC (MPEG-4 Audio)
- Edit audio tracks in the Timeline with trim, slip, and move
- Retime audio tracks with pitch change
- Scrub audio tracks for frame-accurate positioning
- Control balance, gain, mute, and solo individually
- Use master audio controls for global audio adjustments
- Keyframe audio volume in Audio Editor
- Trigger parameter changes based on audio frequencies or transient hits

## Integration and Third-Party Support

- Open Timeline data from Final Cut Pro, including cuts, layers, transforms, and retiming data
- Open Motion directly from the Final Cut Pro Timeline, bypassing import/export steps
- Create master templates in Motion that retain editable text and drop zones in Final Cut Pro
- Animations from Motion automatically update in the Final Cut Pro Timeline when changes are made in Motion
- Round-trip editing between DVD Studio Pro and Motion, making it simple to create and modify Motion menus without intermediate rendering
- Send audio from Motion to Soundtrack Pro Waveform Editor; sound design changes in Soundtrack Pro automatically update in Motion
- Drag and drop Motion 3 native project files into Adobe After Effects 6.5 or 7.0, without rendering
- Preview projects on a broadcast monitor using AJA I/O or Blackmagic devices
- Import vector PDF graphics or Photoshop layered documents
- Import OpenEXR files (Float processing requires a graphics card with 128MB of VRAM; 256MB or more recommended)
- Support for third-party FxPlug plug-ins
- Support for Core Image Unit plug-ins

## Export

- Export to HDV, H.264, MPEG-4, and other QuickTime-supported codecs
- Export as movies or image sequences
- Export as 16-bit or 32-bit floating-point OpenEXR format (Float processing requires a graphics card with 128MB of VRAM; 256MB or more recommended)
- Support for progressive and field-based rendering
- Accelerated motion blur with customizable shutter
- Save custom export settings for easier selection
- Render back to the Timeline

1. Copy protection requires that you output your project to a replicator. Macrovision requires that users work with a Macrovision-certified replication facility or execute a Macrovision usage agreement. Check with your replicator for costs and minimum quantities

# Final Cut Studio 2: Compressor 3 - Technical Specifications

Final Cut Studio 2 - Part Numbers	
Retail	MA886Z/A
Upgrade from Final Cut Pro	MA887Z/A
Academic	MA886Z/A

## Additional Information

- [Final Cut Studio 2 - Technical Specifications](#)

## Minimum Requirements to Install All Final Cut Studio Applications

- A Macintosh computer with a 1.25GHz or faster PowerPC G4, PowerPC G5, Intel Core Duo, or Intel Xeon processor
- 1GB of RAM
- An AGP or PCI Express Quartz Extreme graphics card (Final Cut Studio is not compatible with integrated Intel graphics processors)
- A display with 1024-by-768 resolution or higher
- Mac OS X v10.4.9 or Mac OS X v10.5.5 or later
- QuickTime 7.1.6 or later
- A DVD drive for installation

## Available Disk Space

- 4GB of disk space required to install all applications (Final Cut Pro, Color, DVD Studio Pro, Soundtrack Pro, Motion, Cinema Tools, LiveType, Compressor, and Apple Qmaster)
- Additional 55GB required to install all optional templates, content, and tutorials (may be installed on separate disks):
- 9GB for DVD Studio Pro content
- 8GB for Motion templates and tutorial media
- 24GB for Soundtrack Pro audio content
- 12GB for LiveFonts and LiveType animated elements and templates
- 2GB for Apple Pro Training Final Cut Studio Tutorials media

## Recommended Configurations

### The following are recommended for all applications:

- 2GB of RAM when working with compressed HD and uncompressed SD sources
- 4GB of RAM when working with uncompressed HD sources
- A display with 1280 x 1024 resolution or higher
- 4 GB of hard disc space is required to install all of the Final Cut Studio 2 applications
- An additional 55 GB of hard disc space is required to install all optional templates, content, and tutorials (may be installed on separate discs):
- 9 GB for DVD Studio Pro content
- 8 GB for Motion templates and tutorial media
- 24 GB for Soundtrack Pro audio content
- 12 GB for LiveFonts and LiveType animated elements and templates
- 2 GB for Apple Pro Training Final Cut Studio Tutorials media

\*Some features require additional hardware. Capturing HD resolution video using the ProRes 422 format requires a Mac Pro with an Intel Xeon processor or a G5 Quad computer and a qualified third-party capture card. DV, DVCPRO 50, and DVCPRO HD output requires a FireWire-enabled camera or deck. SD output via FireWire requires an AJA Io. Please contact your Apple Authorized Reseller for information.

## Compressor 3

## High-Performance Encoding

- H.264 Apple devices, web, mobile devices, and HD DVD
- Compatible I-frame insertion
- Full QuickTime support
- MPEG-2 encoding
- MPEG-1 encoding
- MPEG-4 encoding
- Distributed encoding with segmentation options
- Two-pass VBR encoding for MPEG-2
- Provides Dolby-certified encoding to Dolby Digital Professional AC-3 format
- Accepts QuickTime (single-channel or multichannel), AIFF, Sound Designer, and WAV files
- Advanced chaptering for AppleTV and podcasting
- Closed caption support for QuickTime and MPEG-2
- Scaling and down-converting
- Standards conversions
- Retiming
- Preview with split-screen comparison
- High-quality image processing
- More than 100 presets included
- Automated encoding with droplets
- Automatic and custom cropping
- Automatic and custom padding
- 14 image processing filters: brightness/contrast; highlight, midtone, and shadow color corrections; deinterlacing; gamma correction; noise removal; sharpen edge; black/white restore; watermark; text overlay; timecode generator; fade in/out; and letterbox
- Four audio filters: dynamic range; peak limiter; Apple: AUGraphicEQ and fade in/out
- Post encoded files to iDisk or FTP
- Reverse Telecine
- Deinterlacing
- Droplets for automation

## Dolby Digital Professional Encoding

- Dolby-certified encoding to Dolby Digital Professional AC-3 format
- Accepts QuickTime (single-channel or multichannel), AIFF, Sound Designer, and WAV format sound files for encoding
- Support for all channel formats from mono to 5.1 surround sound
- Automatically creates 2.0 or 5.1 based on number of channels in the source media file
- Confidence decoding for preview of AC-3 files

## Video Filters

- BlackWhite Restore
- Brightness and Contrast
- Color Correct Highlights
- Color Correct Midtones
- Color Correct Shadows
- Deinterlacing
- Fade In/Out
- Gamma Correction
- Letterbox
- Noise Removal
- Sharpen Edge
- Text Overlay
- Timecode Generator
- Watermark (Image, animated with QuickTime or Motion files)

## Audio Filters

# 543\_Final Cut Studio 2- Compressor 3 - Technical Specifications.pdf

- Dynamic Range
- Peak Limiter
- Apple: AUGraphicEQ
- Fade In/Out

## Input Video Formats

- QuickTime
  - Apple ProRes 422
  - Animation
  - BMP
  - Video
  - Cinepak
  - DV
  - DVCPRO
  - DVCPRO HD
  - H.261
  - H.263
  - H.264
  - JPEG 2000
  - M-JPEG A
  - M-JPEG B
  - Photo JPEG
  - Planar RGB
  - PNG
  - Sorenson 2
  - Sorenson 3
  - TGA
  - Uncompressed 8- and 10-bit video
- MPEG-1
- MPEG-2
  - Elementary
  - Program
- MPEG-4
- AVI

## Input Audio Formats

- QuickTime
  - AIFF
  - Sound Designer
  - WAV
- Dolby Digital (AC-3)
- Soundtrack Pro STAP

## Over 100 Presets

- Apple Devices
- Podcasting
- Advanced Format Conversions
- Audio Formats
- SD DVD

# 543\_Final Cut Studio 2- Compressor 3 - Technical Specifications.pdf

- HD DVD
- Motion Graphics
- Web
- Modify Apple presets
- Create your own

## Apple Qmaster

- Provides distributed encoding and rendering for DVD Studio Pro (via Compressor) and Shake and image-based rendering applications
- Distribute jobs to up to 10 nodes
- Segment jobs to multiple computers or send complete movies to single nodes
- AutoCluster provides easy setup for unmanaged services
- Create virtual render farms by turning on services to split processor performance
- Control managed services with Qadministrator
- Scheduling allows additional Mac systems to be used during off-hours
- Specify cluster storage location to be on local disk or Xsan
- Note: AVI, 3G, Dolby Digital, and AIFF cannot be segmented to multiple systems

## Output Video Formats

- AVI
- QuickTime
  - Animation
  - Apple Pixlet
  - BMP
  - Video
  - Cinepak
  - DV
  - DVCPRO
  - H.261
  - H.263
  - H.264
  - JPEG 2000
  - M-JPEG A
  - M-JPEG B
  - Photo JPEG
  - Planar RGB
  - PNG
  - Sorenson 2
  - Sorenson 3
  - TGA
  - Video
- MPEG-1
- MPEG-2
  - Elementary
  - Transport
  - Program
- MPEG-4
  - M4V
  - M4A
  - MP4
- Sequential TIFF and TGA
- 3G (3GPP)

## Output Audio Formats

- QuickTime
  - AIFF (PCM)
  - AAC
  - Alaw 2:1
  - Dolby Digital Professional
  - IMA 4:1
  - Linear PCM
  - MACE 3:1
  - MACE 6:1 QDesign Music 2
  - Qualcomm PureVoice
  - uLAW 2:1
- Dolby Digital (AC-3) 2.0 and 5.1 surround sound
- MP3

1. Copy protection requires that you output your project to a replicator. Macrovision requires that users work with a Macrovision-certified replication facility or execute a Macrovision usage agreement. Check with your replicator for costs and minimum quantities

Published Date: Jun 26, 2009



# Final Cut Studio 2: Color - Technical Specifications

Final Cut Studio 2 - Part Numbers	
Retail	MA886Z/A
Upgrade from Final Cut Pro	MA887Z/A
Academic	MA886Z/A

## Additional Information

- [Final Cut Studio 2 - Technical Specifications](#)

## Minimum Requirements to Install All Final Cut Studio Applications

- A Macintosh computer with a 1.25GHz or faster PowerPC G4, PowerPC G5, Intel Core Duo, or Intel Xeon processor
- 1GB of RAM
- An AGP or PCI Express Quartz Extreme graphics card (Final Cut Studio is not compatible with integrated Intel graphics processors)
- A display with 1024-by-768 resolution or higher
- Mac OS X v10.4.9 or Mac OS X v10.5.5 or later
- QuickTime 7.1.6 or later
- A DVD drive for installation

## Available Disk Space

- 4GB of disk space required to install all applications (Final Cut Pro, Color, DVD Studio Pro, Soundtrack Pro, Motion, Cinema Tools, LiveType, Compressor, and Apple Qmaster)
- Additional 55GB required to install all optional templates, content, and tutorials (may be installed on separate disks):
- 9GB for DVD Studio Pro content
- 8GB for Motion templates and tutorial media
- 24GB for Soundtrack Pro audio content
- 12GB for LiveFonts and LiveType animated elements and templates
- 2GB for Apple Pro Training Final Cut Studio Tutorials media

## Recommended Configurations

### The following are recommended for all applications:

- 2GB of RAM when working with compressed HD and uncompressed SD sources
- 4GB of RAM when working with uncompressed HD sources
- A display with 1280 x 1024 resolution or higher
- 4 GB of hard disc space is required to install all of the Final Cut Studio 2 applications
- An additional 55 GB of hard disc space is required to install all optional templates, content, and tutorials (may be installed on separate discs):
- 9 GB for DVD Studio Pro content
- 8 GB for Motion templates and tutorial media
- 24 GB for Soundtrack Pro audio content
- 12 GB for LiveFonts and LiveType animated elements and templates
- 2 GB for Apple Pro Training Final Cut Studio Tutorials media

## Color-Specific Requirements

- The standard graphics card in any Mac Pro, 17-inch MacBook Pro, 24-inch iMac, or 2.5GHZ or faster Power Mac G5 Quad:
- ATI Mobility Radeon X1600

# 545\_Final Cut Studio 2- Color - Technical Specifications.pdf

- ATI Radeon X1600
- NVIDIA GeForce 7800 GT, 7600 GT, 7300 GT, 6800 Ultra DDL, 6800 GT DDL, 660, or Quadro FX 4500.

- For 32-bit rendering: a graphics card with at least 256MB of VRAM.
- A display with 1680-by-1050 resolution or higher (excluding 20" iMac); dual displays are highly recommended.
- A three-button mouse for full functionality

## Color-Configuration Recommendations

- ATI Radeon C1900 XT graphics card
- Dual Displays with 1920 x 1200 or higher resolution

\*Some features require additional hardware. Capturing HD resolution video using the ProRes 422 format requires a Mac Pro with an Intel Xeon processor or a G5 Quad computer and a qualified third-party capture card. DV, DVCPRO 50, and DVCPRO HD output requires a FireWire-enabled camera or deck. SD output via FireWire requires an AJA Io. Please contact your Apple Authorized Reseller for information.

## Color

### Color Grading

- Real-time grading controls for SD, HD, and 2K without proxies
- Workflow-oriented interface divides controls into eight separate "rooms"
- Primary, Secondary, and Primary Out grading functions
- Color wheels with hue, saturation, and luminance controls for highlights, midtones, and shadows
- Curves for individual adjustment to R,G,B and luma with B-spline control points
- Advanced RGB and Printer Points controls for precise film printing
- Switch between four live grades per shot
- Autobalance correction available in Primary room
- ASC-style Lift, Gamma, Gain controls
- Eight secondaries per shot with custom mattes, key blur, and motion tracking
- Animated circle, rectangle, and user shape Vignettes with inner and outer softness
- Keyframing with interpolation for most controls
- Color FX with node trees for compositing control
- Still Store for saving and comparing reference images
- Pan and Scan with preset aspect ratios
- Real-time waveform monitor, vectorscopes, and histograms
- 3D Color Space scopes for RGB, HSL, Y'CbCr, and IPT display
- Broadcast-safe limiting
- Support for 3D LUTs for display calibration and output simulation
- Multiple video tracks
- Support for third-party control surfaces with trackballs and knobs
- EDL support for DPX and Cineon files
- Can render directly to DPX or Cineon file formats for film out
- Use EDLs for "notching" programs without XML metadata

### Effects

- Over 50 Color FX and premade looks
- Renders at 8-bit, 10-bit, and 32-bit floating point (dependent on GPU)
- Customizable node tree for effects creation
- Save and reuse favorite effects
- Support for third-party plug-ins
- Preview playback of SD, HD and, 2K on an attached Apple Cinema Display or third-party video card

### Supported Formats

# 545\_Final Cut Studio 2- Color - Technical Specifications.pdf

- Support for 4:4:4 2K as DPX or Cineon files
- Apple Uncompressed 8-bit 4:2:2
- Apple Uncompressed 10-bit 4:2:2
- TIFF, JPEG, and JPEG 2000 image sequences
- Apple ProRes 422 and Apple ProRes 422 (HQ), an 8- or 10- bit, full-resolution VBR format with target bit rates of 145 Mbps and 220 Mbps
- Ability to render all formats at uncompressed HD or ProRes 422 and ProRes 422 (HQ)
- Optional proxy creation for DPX and Cineon files
- Third-party codecs from AJA and Blackmagic Design
- IMX, HDV, XDCAM HD and XDCAM HD 422 can be graded but must be rendered at ProRes 422 or uncompressed resolution

## Integration with Final Cut Pro 6

- Round-trip projects between Color and Final Cut Pro 6 with Send to Color and Send to Final Cut Pro
- Color projects configured automatically to match Final Cut Pro sequence settings
- 2K Digital Intermediate workflow with Final Cut Pro
- Support for all standard frame rates and frame sizes
- Displays dissolves and fades in the Timeline and renders for 2K projects
- Constant speed change displayed in Color for playback in real time
- Pan and Scan metadata sent to Final Cut Pro as Motion effect

## Trimming for 2K Output

- Trimming controls when rendering directly to DPX or Cineon files
- Ripple
- Roll
- Slip
- Splice
- Merge edits

1. Copy protection requires that you output your project to a replicator. Macrovision requires that users work with a Macrovision-certified replication facility or execute a Macrovision usage agreement. Check with your replicator for costs and minimum quantities

Published Date: Jun 26, 2009

# MacBook Pro (17-inch, Mid 2009) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:

0.98 inch (2.50 cm)

Width:

15.47 inches (39.3 cm)

Depth:

10.51 inches (26.7 cm)

Weight:

6.6 pounds (2.99 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- One FireWire 800 port (up to 800 Mbps)
- Three USB 2.0 ports (up to 480 Mbps)
- Mini DisplayPort
- Audio line in
- Audio line out
- ExpressCard/34 slot
- Kensington lock slot

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone (located under left speaker grille)
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/audio line out (minijack)

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free internal cables
- Reduced packaging volume
- Meets ENERGY STAR Version 5.0 requirements
- Rated EPEAT Gold

## Display

- 17-inch (diagonal) high-resolution LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1920 by 1200 (native), 1680 by 1050, 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio stretched; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

# 546\_MacBook Pro (17-inch, Mid 2009) - Technical Specifications.pdf

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>
- NVIDIA GeForce 9600M GT graphics processor with 512MB of GDDR3 memory
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- Built-in iSight camera
- Mini DisplayPort

## Pure digital video output

**DVI output** using Mini DisplayPort to DVI Adapter (optional)

**VGA output** using Mini DisplayPort to VGA Adapter (optional)

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)

## Input

- Built-in full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports two-finger scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.8GHz or 3.06GHz Intel Core 2 Duo processor with 6MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 memory; two SO-DIMM slots support up to 8GB

Configure your MacBook Pro now, only at the Apple Online Store.

## Storage

- 500GB 5400-rpm Serial ATA hard drive; optional 500GB 7200-rpm hard drive, or 128GB or 256GB solid-state drive<sup>4</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>5</sup>

- Built-in 95-watt-hour lithium-polymer battery
- 85W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

- MacBook Pro
- Display cleaning cloth
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Install/restore DVDs
- Printed and electronic documentation

# 546\_MacBook Pro (17-inch, Mid 2009) - Technical Specifications.pdf

## Software

- Mac OS X v10.5 Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## 17-inch Configuration

	2.8GHz MacBook Pro (MC226LL/A)
Enclosure	Precision aluminum unibody
Processor	2.8GHz Intel Core 2 Duo
L2 cache	6MB shared
System bus	1066MHz
Memory	4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 8GB
Hard drive <sup>4</sup>	500GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
Graphics	NVIDIA GeForce 9600M GT graphics processor; and NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>
Graphics memory	512MB GDDR3
Video	Built-in iSight camera; Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI (requires adapters, sold separately)
Display	17-inch (diagonal) high-resolution LED-backlit glossy widescreen display, 1920-by-1200 resolution
Expansion	One FireWire 800 port (up to 800 Mbps), three USB 2.0 ports (up to 480 Mbps), ExpressCard/34 slot
Audio	Built-in stereo speakers, built-in omnidirectional microphone, combined optical digital input/analog line in, combined optical digital output/analog line out
Networking	Built-in 10/100/1000BASE-T (Gigabit) Ethernet
Wireless	Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification) <sup>2</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate) module
Hardware accessories	85W MagSafe Power Adapter, AC wall plug, power cord
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.
Apple and the global environment	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 500GB or 1TB server-grade hard drive
- Wi-Fi Certified for 802.11n draft 2.0
- USB port for connecting a USB printer or USB external hard drive

### Configure to order

- 500GB (7200-rpm) hard drive
- 128GB or 256GB solid-state drive
- Up to 8GB of 1066MHz DDR3 SDRAM
- Antiglare display
- Apple Remote

# 546\_MacBook Pro (17-inch, Mid 2009) - Technical Specifications.pdf

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan
- Aperture
- Final Cut Express
- Logic Express
- iWork '09

## Accessories

- Apple LED Cinema Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Apple Wireless Mighty Mouse
- Apple Keyboard with Numeric Keypad
- Apple Wired Mighty Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. 1GB=1 billion bytes; actual formatted capacity less.
  5. Testing conducted by Apple in May 2009 using preproduction 2.8GHz Intel Core 2 Duo-based MacBook Pro units with a Better Battery Life setting. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Apr 6, 2016

# Final Cut Studio 2: DVD Studio Pro 4.2 - Technical Specifications

Final Cut Studio 2 - Part Numbers	
Retail	MA886Z/A
Upgrade from Final Cut Pro	MA887Z/A
Academic	MA886Z/A

## Additional Information

- [Final Cut Studio 2 - Technical Specifications](#)



## Minimum Requirements to Install All Final Cut Studio Applications

- A Macintosh computer with a 1.25GHz or faster PowerPC G4, PowerPC G5, Intel Core Duo, or Intel Xeon processor
- 1GB of RAM
- An AGP or PCI Express Quartz Extreme graphics card (Final Cut Studio is not compatible with integrated Intel graphics processors)
- A display with 1024-by-768 resolution or higher
- Mac OS X v10.4.9 or Mac OS X v10.5.5 or later
- QuickTime 7.1.6 or later
- A DVD drive for installation

## Available Disk Space

- 4GB of disk space required to install all applications (Final Cut Pro, Color, DVD Studio Pro, Soundtrack Pro, Motion, Cinema Tools, LiveType, Compressor, and Apple Qmaster)
- Additional 55GB required to install all optional templates, content, and tutorials (may be installed on separate disks):
  - 9GB for DVD Studio Pro content
  - 8GB for Motion templates and tutorial media
  - 24GB for Soundtrack Pro audio content
  - 12GB for LiveFonts and LiveType animated elements and templates
  - 2GB for Apple Pro Training Final Cut Studio Tutorials media

## Recommended Configurations

### The following are recommended for all applications:

- 2GB of RAM when working with compressed HD and uncompressed SD sources
- 4GB of RAM when working with uncompressed HD sources
- A display with 1280 x 1024 resolution or higher
- 4 GB of hard disc space is required to install all of the Final Cut Studio 2 applications
- An additional 55 GB of hard disc space is required to install all optional templates, content, and tutorials (may be installed on separate discs):
  - 9 GB for DVD Studio Pro content
  - 8 GB for Motion templates and tutorial media
  - 24 GB for Soundtrack Pro audio content
  - 12 GB for LiveFonts and LiveType animated elements and templates
  - 2 GB for Apple Pro Training Final Cut Studio Tutorials media

## DVD Studio Pro-Specific Requirements

- For playback of DVD Studio Pro 4.2-authored HD DVDs: a Macintosh computer with a PowerPC G5 or Intel Core Duo processor
- For writing finished projects to disc: an Apple SuperDrive or other DVD recorder
- For writing finished projects to a double-layer disc: a double-layer-compatible recorder and double-layer media
- For transporting HD projects to a replicator: an external drive or Internet transfer of the project's disk image
- For transporting SD projects that contain copy-protection or dual-layer features to a replicator: a DLT drive, external drive, or Internet transfer of the project's disk image

\*Some features require additional hardware. Capturing HD resolution video using the ProRes 422 format requires a Mac Pro with an Intel Xeon processor or a G5 Quad computer and a qualified third-party capture card. DV, DVCPRO 50, and DVCPRO HD output requires a FireWire-enabled camera or deck. SD output via FireWire requires an AJA Io. Please contact your Apple Authorized Reseller for information.

## DVD Studio Pro 4.2

## Graphical View

- View flow of DVD graphically
- Print or save to PDF
- Use Macro view to navigate easily through large projects
- Flag elements for more attention
- Fit all elements in window, zoom in/out
- Organize tiles with Auto layout command

## Transitions

- Add transitions to menus, menu buttons, slideshows, and timeline-based stills
- Choose from more than 30 prebuilt transitions such as Blur, Dissolve, Droplet, Fade through Color, Melt, Motion Dissolve, Rotate, Rotation Blur, and Zoom
- Create additional Alpha transitions

## Jacket Picture

- Shows picture of choice when user stops playback of DVD on supported DVD players
- Creates all necessary files for jacket picture from any popular image formats

## Automatic MPEG-2 Encoding

- Encode video in the background while you work or while building the DVD
- One- and two-pass variable bit rate (VBR) encoding for MPEG-2
- Three levels of motion estimation
- Support for PAL and NTSC formats
- Support for 4:3 and 16:9 aspect ratios
- DVD-compliant MPEG-2 streams from other encoders accepted
- More advanced encoding options provided via Compressor (included)

## Asset Management

- Organize assets with folders
- Open in Editor
- View status of background encoding
- View information on imported assets such as type, timestamps, length, encoding progress, bit rate, and more
- Reveal the location of the asset in the Finder
- Sort by name and information
- Refresh assets that may have been updated with other applications
- Re-encode source assets
- Reconnect assets

## Advanced Interactivity

- Multistory feature for creating alternative versions (up to 98 stories)
- DVD-ROM functionality using DVD@CCESS (for computer playback only); DVD-ROM input includes the ability to add photos, PDFs, or direct links to websites
- Control actions for remote control buttons, including number offset
- Enable/Disable user operations
- Specify actions for First Play, Title button, Menu button, end jumps, pre-scripts, pre-script targets, Angle button, Chapter button, Audio button, Subtitle, and Return

## Pre-mastering Options

- Region encoding
- Industry-standard analog and digital copyright management with Macrovision (Types 1, 2, and 3) and CSS for SD projects<sup>1</sup>
- Test functionality with built-in Simulator
- Test built projects with Apple DVD Player software
- Allows burning first layer of DVD-9 project to DVD-5 media for testing
- Supports 12- and 8-cm discs, single and double layer
- Dual-layer options:
  - Choose between Parallel Track Path (PTP) and Opposite Track Path (OTP)
  - Specify the dual-layer break point
  - Specify a non-seamless or seamless dual-layer break point
- Format existing builds to DVD-R and DLT
- Burn DVD-9 projects to double-layer media for testing
- Replication to red laser media
- Replication to blue laser media (for HD DVD)

## Import

- Maintains named chapter markers from Final Cut Pro, Final Cut Express, and iMovie
- DVD Studio Pro 2 and 3 projects
- iDVD 3 and 4 projects
- AIFF
- AVI
- BMP
- DV
- JPEG
- Macromedia Flash 5
- MPEG-1
- MP3 (MPEG-1 Layer 3)
- MPEG-2
- M4A, M4P (iTunes 4 audio)
- PDF (Mac OS X)
- Photoshop (with layers)
- PICT
- PNG
- TARGA
- TIFF
- WAV
- Aspect ratios: 4:3 and 16:9
- TV systems: PAL and NTSC
- Frame rates: 29.97 fps (NTSC) and 25 fps (PAL)
- Maximum GOP sizes: 18 frames (NTSC), 15 frames (PAL)
- All QuickTime supported codecs – encoded to MPEG-2 (SD or HD DVD)
- H.264 and HDV (supported natively in HD DVD projects)

## Audio Formats

- STAP (Soundtrack audio file) support
- MPEG-1 Layer 2 (64 to 384 Kbps)
- Dolby Digital AC-3 (mono to 5.1 surround using 64 to 448 Kbps)
- DTS — mono to 5.1 surround at 48kHz; DTS ES — 6.1 at 96kHz at 754 Kbps or 1509 Kbps
- Stereo PCM (16 bit/48kHz at 1536 Kbps)
- Stereo PCM (24 bit/96kHz at 4608 Kbps)
- Other QuickTime audio formats automatically transcoded to AIFF/PCM

## DVD Standards

- Author traditional DVDs using SD assets
- Author HD DVDs using SD and HD assets

## Output Formats

- DVD-R, DVD-RW, DVD+R, DVD+RW, double-layer media
- Double-layer media support
- DLT drive (required for DVD-9 projects)
- DDP 2.0 and 2.1
- CMF 1.0
- CMF 2.0
- DDP 3.0
- Disk Image
- Video\_TS to hard drive
- HVDVD\_TS to hard drive

## Menus

- Choose from a wide variety of automatic transitions
- Create your own transitions
- Includes several theme-based royalty-free Apple-designed templates that can be user-customized
- Supports up to 36 buttons per menu (18 for 16:9 aspect ratio)
- Templates in both NTSC and PAL formats
- Allows still menus and buttons to be made from layered Photoshop files
- Allows motion menus to be made from video streams
- Set the loop point on motion menus to avoid replaying intro transition
- Add effects to menus and buttons with shapes and drop zones
- Built-in action-safe and title-safe areas
- View menus with rectangular or square pixels
- Use grayscale and chroma color mapping
- Create language-localized versions of the same menu

## Connections

- Automatically assign functionality to assets with one click using over 60 combinations of context-sensitive drop palettes
- Automatically create movie scene indexes based on chapter markers

## User Interface

- Mode-free interface for workflow efficiency
- Rearrange interface tabs to different quadrants to create different workflows
- Save user-defined workspace configurations (three preset configurations)
- Customizable toolbar

## Timeline

- Manage up to 9 video angles, 8 audio streams, and 32 subtitle streams per track
- Add, modify, and delete chapter markers in the Timeline
- Trim audio and video clips interactively or with timecode
- Combine multiple video clips and slides into one track
- Stills in Timeline are added to DVD as space-saving stills, not generated video
- Add up to 99 tracks in a project

- Import Line 21 files for closed caption support, for NTSC SD projects only
- Two types of angles:
  - Multiple angles add another full-length segment to track
  - Mixed angles add only video that is different from the first video angle

## Subtitling

- Integrated subtitler
- Add up to 32 subtitle streams per track
- Set position, font, size, style and color, fade in and fade out
- Enter timecode or drag in Timeline to set start, stop, and duration
- View built-in title-safe and action-safe areas
- Use graphics in subtitles
- Import subtitles in .son, .stl, .txt, and .scr formats
- Use buttons over video

## Slideshows

- Choose from a wide variety of automatic transitions
- Create your own transitions
- Fit slideshow to audio
- Apply audio to individual slides
- Convert slideshow to a track
- Set a slide duration or choose manual advance
- Use PSD (8-bit RGB), TIFF, JPEG, BMP, TARGA, PICT, and any other QuickTime-based image format

## VTS Editor

- Automatic allocation of projects's assets to VTS folders
- Automatic placement of menu's assets into VTS folders
- Manually move elements between multiple VTS folders
- Up to 99 VTS folders per project

## Scripting

- Jump to motion menu loop point
- Advanced scripting controls to program the DVD to play back from the correct location on the disc; switch audio, video, and subtitle streams depending on context; and temporarily change parental controls
- Access to 8 GPRMs with partition options to 112
- Add pre-script commands to menus, tracks, and slideshows
- Use up to 124 commands per script
- 10 scripting commands, including Jump, Set GPRM, Goto Set System Stream, Resume, GPRM mode, Exit, Exit Pre-script, and Jump Indirect
- Machine-level control
- View values of GPRM and SPRM registers in Simulator
- Bit-wise operations

1. Copy protection requires that you output your project to a replicator. Macrovision requires that users work with a Macrovision-certified replication facility or execute a Macrovision usage agreement. Check with your replicator for costs and minimum quantities

# MacBook Air (Mid 2009) - Technical Specifications

## Size and weight

Height:  
0.16-0.76 inch (0.4-1.94 cm)  
Width:  
12.8 inches (32.5 cm)  
Depth:  
8.94 inches (22.7 cm)  
Weight:  
3.0 pounds (1.36 kg)<sup>1</sup>

## Processor and memory

- 1.86GHz or 2.13GHz Intel Core 2 Duo processor with 6MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 2GB of 1066MHz DDR3 SDRAM onboard

Configure your MacBook Air now, only at the Apple Online Store.

## Storage

- 120GB 4200-rpm Serial ATA hard disk drive or 128GB solid-state drive<sup>2</sup>
- Optional external USB MacBook Air SuperDrive

## Environmental status report

MacBook Air is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- Mercury-free LED-backlit display
- PVC-free internal cables
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR Version 5.0 requirements
- Rated EPEAT Gold

## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>
- Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- Built-in iSight camera
- Mini DisplayPort

## Pure digital video output

**DVI output** using Mini DisplayPort to DVI Adapter (optional)

**VGA output** using Mini DisplayPort to VGA Adapter (optional)

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)

# 548\_MacBook Air (Mid 2009) - Technical Specifications.pdf

- Backlit keyboard with ambient light sensor for automatic adjustment of keyboard illumination and screen brightness
- Solid-state trackpad with Multi-Touch gesture support for precise cursor control; supports two-finger scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Wireless

- Built-in AirPort Extreme Wi-Fi wireless networking<sup>4</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)

## Peripheral connections

## Audio

- Analog audio output/headphone out (minijack)
- Built-in mono speaker
- Built-in omnidirectional microphone

## Battery and power<sup>5</sup>

- Integrated 40-watt-hour lithium-polymer battery
- 45W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Software

- Mac OS X v10.5 Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## What’s in the box

- MacBook Air
- 45W MagSafe Power Adapter, AC wall plug, power cord
- Apple USB Ethernet Adapter
- Install/restore DVDs
- Display cleaning cloth
- Printed and electronic documentation

## Configurations

	1.86GHz MacBook Air (MC233LL/A)	2.13GHz MacBook Air (MC234LL/A)
Enclosure	Precision aluminum unibody	
Processor	1.86GHz Intel Core 2 Duo	2.13GHz Intel Core 2 Duo
L2 cache	6MB shared	
System bus	1066MHz	
Memory	2GB of 1066MHz DDR3 SDRAM onboard	
Hard drive <sup>2</sup>	120GB 4200-rpm Serial ATA	128GB solid-state drive
Slot-loading optical drive	Optional external USB MacBook Air SuperDrive (sold separately)	

	1.86GHz MacBook Air (MC233LL/A)	2.13GHz MacBook Air (MC234LL/A)
<b>Graphics</b>	NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>	
<b>Video</b>	Built-in iSight camera; Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI (requires adapters, sold separately)	
<b>Display</b>	13.3-inch (diagonal) LED-backlit glossy widescreen display, 1280-by-800 resolution	
<b>USB</b>	One USB 2.0 port (up to 480 Mbps)	
<b>Audio</b>	Built-in mono speaker, built-in omnidirectional microphone, analog audio output/headphone out	
<b>Networking</b>	Apple USB Ethernet Adapter (included)	
<b>Wireless</b>	Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification) <sup>4</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate) module	
<b>Hardware accessories</b>	45W MagSafe Power Adapter, AC wall plug, power cord	
<b>Limited warranty and service</b>	Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
<b>Apple and the global environment</b>	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
<b>Recycling</b>	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Accessories

### MacBook Air SuperDrive

Play or burn discs directly with the external USB-based MacBook Air SuperDrive. Thin, light, and easy to take with you, this drive is designed specifically for MacBook Air.

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Size: 139 x 139 x 17 mm / 5.47 x 5.47 x 0.67 inches (L x W x H)
- Weight: 320 g (0.71 pound)
- Requires MacBook Air with available USB 2.0 port

### MagSafe Airline Adapter

Plug into your airline seat power port and keep MacBook Air powered up for the entire flight.

Connect your MacBook Air to an external display or projector using one of these adapters.

### Mini DisplayPort to DVI Adapter

### Mini DisplayPort to Dual-Link DVI Adapter

### Mini DisplayPort to VGA Adapter

Time Capsule

AirPort Extreme Base Station

AirPort Express Base Station

Apple Wireless Keyboard

Apple Wireless Mighty Mouse

Apple USB Modem

AppleCare Protection Plan



1. Actual weight varies by configuration and manufacturing process.
2. 1GB=1 billion bytes; actual formatted capacity less.
3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
4. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
5. Testing conducted by Apple in May 2009 using preproduction 2.13GHz Intel Core 2 Duo-based MacBook Air units. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Jun 10, 2009

# Final Cut Studio 2: Soundtrack Pro 2.0 - Technical Specifications

Final Cut Studio 2 - Part Numbers	
Retail	MA886Z/A
Upgrade from Final Cut Pro	MA887Z/A
Academic	MA886Z/A

## Additional Information

- [Final Cut Studio 2 - Technical Specifications](#)

## Minimum Requirements to Install All Final Cut Pro 6

- A Macintosh computer with a 1.25GHz or faster PowerPC G4, PowerPC G5, Intel Core Duo, or Intel Xeon processor
- 1GB of RAM
- An AGP or PCI Express Quartz Extreme graphics card (Final Cut Studio is not compatible with integrated Intel graphics processors)
- A display with 1024-by-768 resolution or higher
- Mac OS X v10.4.9 or Mac OS X v10.5.5 or later
- QuickTime 7.1.6 or later
- A DVD drive for installation

## Available Disk Space

- 4GB of disk space required to install all applications (Final Cut Pro, Color, DVD Studio Pro, Soundtrack Pro 2.0, Motion, Cinema Tools, LiveType, Compressor, and Apple Qmaster)
- Additional 55GB required to install all optional templates, content, and tutorials (may be installed on separate disks):
- 9GB for DVD Studio Pro content
- 8GB for Motion templates and tutorial media
- 24GB for Soundtrack Pro audio content
- 12GB for LiveFonts and LiveType animated elements and templates
- 2GB for Apple Pro Training Final Cut Studio Tutorials media

## Recommended Configurations

### The following are recommended for all applications:

- 2GB of RAM when working with compressed HD and uncompressed SD sources
- 4GB of RAM when working with uncompressed HD sources
- A display with 1280 x 1024 resolution or higher
- 4 GB of hard disc space is required to install all of the Final Cut Studio 2 applications
- An additional 55 GB of hard disc space is required to install all optional templates, content, and tutorials (may be installed on separate discs):
- 9 GB for DVD Studio Pro content
- 8 GB for Motion templates and tutorial media
- 24 GB for Soundtrack Pro audio content
- 12 GB for LiveFonts and LiveType animated elements and templates
- 2 GB for Apple Pro Training Final Cut Studio Tutorials media

## Soundtrack Pro 2.0-Specific Requirements

- For 5.1 surround monitoring of multichannel audio content: an audio interface with a minimum of six outputs
- for multitrack recording: an audio interface with multiple inputs

\*Some features require additional hardware. Capturing HD resolution video using the ProRes 422 format requires a Mac Pro with an Intel Xeon processor or a G5 Quad computer and a qualified third-party capture card. DV, DVCPRO 50, and DVCPRO HD output requires a FireWire-enabled camera or deck. SD output via FireWire requires an AJA Io. Please contact your Apple Authorized Reseller for information.

## Soundtrack Pro 2.0

### Precise Audio Control

- Nondestructive, sample-accurate editing of audio files
- Support for up to 24-channel files, including mono, stereo, and surround
- Action-based editing to modify, reorder, suspend, or delete any audio edit, plug-in, or process
- Audio Effects and Audio Units plug-ins can be applied to supported audio files as Actions

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- Audio Effects and Audio Units plug-ins can be applied to supported audio files as real-time effect chains
- Real-time effects applied to audio files can be rendered to Actions
- Intelligent analysis, repair, and restoration functions for:
  - Clicks and pops
  - Power line hum
  - DC offset
  - Phase
  - Clipped signal
- Integrated multichannel file editor
- Audio time stretching without affecting pitch
- Ambient Noise Print to quickly replace unwanted noises from location recordings
- Background Noise Removal including noise print
- Sample ruler units in sample value, normalized, percent, and decibel view
- Snapping to ruler ticks, zero crossings, markers, and adjacent clips
- Support for bit depths up to 32-bit float
- Support for sample rates from 2kHz to 192kHz
- Support for AIFF, WAV, MP3, CAF, BWF, SDII, NeXT, QuickTime, and STAP (Soundtrack Audio Project) file playback
- Saves files nondestructively as STAP files or destructively as AIFF, WAV, SDII, QuickTime, CAF, or NeXT
- Export mixes as AIFF, WAV, NeXT, SDII, MP3, AAC/Podcast, Dolby Digital Professional (AC-3), or use Compressor for additional file support
- Selection history
- Waveform and customizable frequency spectrum views with linear and logarithmic display
- Frequency selection and editing in frequency spectrum view
- Animated waveform feedback
- Mini-waveform view

## Advanced Sound Design

- Processes including:
  - Fade in/Fade out
  - Normalize
  - Amplitude adjust
  - Silence
  - Invert
  - Swap channels
  - Mono conversion
  - Channel reordering
  - Resample
  - Generate silence, white noise, pink noise, sine wave, sawtooth wave, square wave, or triangle wave
- Support for Audio Units plug-ins
- Audio Units presets available to all Audio Units-compatible applications
- More than 6000 sound effects, music beds, and music loops, including over 1000 in surround
- Powerful media search engine
- Support for Apple Loops, AIFF, WAV, MP3, AAC, CAF, and ACID sound and music libraries

## Advanced Take Management

- Multitake recording with take editing in Multitake Editor
- Multitake Editor allows comps of multitake recordings and other audio files
- Combine individual phrases from different takes
- Automatic customizable crossfade between phrases
- Single-click take selection
- Adjustable transition boundaries for multitake comps
- Final comp functions as stand-alone clip while retaining access to all takes

- Slide phrases within edit boundaries

## Professional Multitrack Audio Editing

- Single window with customizable tab panes
- Customizable window layouts
- Dynamic tab panes with quick show/hide functionality
- Resizable video window tab
- Multitrack Timeline with tracks, busses, submixes, and master in mono, stereo, or surround
- Multiple multitrack and audio file projects open at once
- Mixed sample rates supported in multitrack projects
- Time- or beat-based tracks
- Ruler in HH:MM:SS, seconds, samples, frames, drop frame, non-drop frame, beats
- Loop clip transposition
- Loop clip speed adjustments (quadruple, double, normal, half, quarter)
- Adjustable automatic and manual crossfades
- Fade selector for customizing fade in, fade out, and crossfades
- Tape style and sample repeat scrubbing
- Rolling edit tool
- Native and custom timecode spotting
- Multitrack recording of mono, stereo, and multichannel files
- Lift and stamp tool to selectively copy plug-in sets from one clip to another
- Lift and stamp effect sets can be saved as presets
- Lift and stamp EQ matches the EQ characteristics of one clip to another
- Automation parameters can move with clips or lock to absolute time
- Pull up/pull down of audio and video to all common standards
- Customizable clip and track colors
- Clip locking in multitrack
- Clip disabling in multitrack
- Momentary mono switch
- Automatable master tempo, master volume, master effects, and key
- Automation of most mix and effect parameters with read, touch, and latch modes
- Pre- and post-fader send busses for application of common effect plug-ins to multiple tracks
- Output bussing for single fader control of multiple tracks
- Support for multichannel audio output devices
- Time, duration, podcast, beat, and end-of-project markers
- Powerful browser for locating content quickly
- Multipoint Video HUD
- Tool HUD
- Timecode HUD
- Numeric Clip offset
- Bin with access to multiple projects, media files, markers, and clips
- Spotlight-style searching in Bin

## Surround and Stereo Mixing

- Discrete 5.1 mixing, bussing, and routing
- Console-style Mixer with full stereo and surround meters on every track, buss, submix, and master
- Surround panning of mono, stereo, and surround audio files
- Mono, stereo, and surround files can be combined on same track
- Support for multichannel surround files
- Surround Panner HUD with automatable controls for rotation, width, collapse, center bias, LFE balance, and individual speaker disabling
- Surround and stereo panner automation data simultaneously available on each track
- Automatic surround to stereo Dolby-standard downmix
- Support for true surround and multi-mono effects
- Over 1000 royalty-free surround sound effects and music tracks
- Control surface support (Mackie Control Protocol)

## Surround and Stereo Mixing

# 549\_Final Cut Studio 2- Soundtrack Pro 2.0 - Technical Specifications.pdf

- Discrete 5.1 mixing, bussing, and routing
- Console-style Mixer with full stereo and surround meters on every track, buss, submix, and master
- Surround panning of mono, stereo, and surround audio files
- Mono, stereo, and surround files can be combined on same track
- Support for multichannel surround files
- Surround Panner HUD with automatable controls for rotation, width, collapse, center bias, LFE balance, and individual speaker disabling
- Surround and stereo panner automation data simultaneously available on each track
- Automatic surround to stereo Dolby-standard downmix
- Support for true surround and multi-mono effects
- Over 1000 royalty-free surround sound effects and music tracks
- Control surface support (Mackie Control Protocol)

## Integrated Workflow

- AppleScript scriptable (executable from Soundtrack Pro, Final Cut Pro 6, or as AppleScript droplets for batch processing)
- Automator actions for creation of complex multiapplication workflows in Mac OS X v10.4 or later
- Support for video formats up to HD resolutions
- Integrated video tab
- Output to SD and HD<sup>1</sup> video monitors (via FireWire or PCI card)
- HD<sup>1</sup> or SD output using Digital Cinema Desktop<sup>2</sup> to second Apple Cinema Display
- Send and receive MIDI timecode and beat clock for synchronization with hardware and software
- Integration with Final Cut Pro 6, DVD Studio Pro 4, and Motion 3
- Round-trip audio file editing with Final Cut Pro 6 and Motion 3
- Support for Final Cut Pro 6 scoring markers
- Conform tab to conform audio edit to new Final Cut Pro 6 edits
- Conform visual interface for highlighting changed areas
- Accept or reject changes across entire project or selectively on a change-by-change basis
- Podcast track to create audio-only, enhanced audio, or video podcasts
- Support for chapter, artwork, and URL markers in video and audio podcasts
- Export presets and customizable post-export scripts
- OMF import
- AAF import and export

## Included Effects

TS = True surround

- Dynamics
  - Adaptive Limiter
  - Compressor
  - DeEsser
  - Expander
  - Limiter TS
  - Multichannel Gain TS
  - Multipressor
  - Noise Gate
  - Surround Compressor TS
- Distortion
  - Bitcrusher
  - Clip Distortion
  - Distortion
  - Distortion II
  - Exciter
  - Overdrive
  - Phase Distortion
- EQ and Filter
  - AutoFilter
  - Channel EQ

- Fat EQ
- High Cut
- High Pass Filter
- High Shelving EQ
- Linear Phase EQ
- Low Cut
- Low Pass Filter
- Low Shelving EQ
- Match EQ TS
- Parametric EQ
- Soundtrack Pro AutoFilter
  
- Modulation
  - Chorus
  - Ensemble TS
  - Flanger
  - Modulation Delay
  - Phaser
  - Scanner Vibrato
  - Tremolo TS
  
- Reverb/Delay
  - PlatinumVerb
  - Soundtrack Pro Reverb
  - Space Designer TS
  - Stereo Delay
  - Tape Delay
  
- Metrics and Diagnostics
  - Correlation Meter
  - Multi Meter TS
  - Test Oscillator
  - TunerTS
  
- Miscellaneous
  - Denoiser
  - Direction Mixer
  - Enveloper
  - Gain
  - Pitch Shifter II
  - Ringshifter
  - Spectral Gate
  - Stereo Spread
  - SubBass
  - Vocal Transformer

1. HD requires a Power Mac with 1GHz or faster single or dual processors and 1GB of RAM or any Intel-based Macintosh with a minimum of 1GB of RAM.
2. Digital Cinema Desktop requires a dual-port AGP card with second display.

Published Date: Jun 26, 2009

# Power Mac G4 (FW800) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Power Mac G4 (FW800) - Technical Specifications

Configurations			
Order number	M8839LL/A	M8840LL/A	M8841LL/A
Processor	1GHz PowerPC G4	Dual 1.25GHz PowerPC G4	Dual 1.42GHz PowerPC G4
L3 cache	1MB DDR SRAM	1MB DDR SRAM per processor	2MB DDR SRAM per processor
System bus	133MHz	167MHz	167MHz
Main memory (2GB maximum <sup>4</sup> )	256MB PC2100 (266MHz) DDR SDRAM	256MB PC2700 (333MHz) DDR SDRAM	512MB PC2700 (333MHz) DDR SDRAM
Hard drive	60GB Ultra ATA/100; 7200 rpm <sup>5</sup>	80GB Ultra ATA/100; 7200 rpm <sup>5</sup>	120GB Ultra ATA/100; 7200 rpm <sup>5</sup>
Optical drive	Combo (DVD-ROM/CD-RW)	Combo (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)
Graphics support	NVIDIA GeForce4 MX with 64MB of DDR SDRAM	ATI Radeon 9000 Pro with 64MB of DDR SDRAM	ATI Radeon 9000 Pro with 64MB of DDR SDRAM
Expansion slots and bays	Four open full-length 64-bit, 33MHz PCI slots; AGP 4X slot with graphics card installed; four DIMM slots; four internal hard drive bays (one occupied); two optical drive bays (one occupied)		
Ports	One FireWire 800 port, two FireWire 400 ports, four USB ports, front headphone minijack and speaker, rear Apple speaker minijack, audio line in and audio line out minijacks, ADC and DVI connectors for dual display support		
Networking	Built-in 10/100/1000BASE-T Ethernet and 56K modem <sup>6</sup> ; AirPort Extreme ready <sup>2</sup> ; Bluetooth ready		
Software	Mac OS X with Classic environment, QuickTime, iCal, iChat, iLife (includes iTunes, iPhoto, iMovie, and iDVD8), DVD Player, iSync, Mac OS X Mail, Microsoft Internet Explorer, EarthLink, Acrobat Reader, Art Directors Toolkit, FAXstf, FileMaker Pro Trial, GraphicConverter, Microsoft Office v. X Test Drive, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, and Developer Tools		
Service and support	90 days of free telephone support and one-year limited warranty		
Also included	Apple Pro Keyboard, Apple Pro Mouse, USB keyboard extension cable, DVI to VGA adapter, modem cable		
Options			
Memory	PC2100 or PC2700 DDR SDRAM): 256MB, 512MB, 1GB, 1.5GB, 2GB		
Hard drives	60GB Ultra ATA/100 (7200 rpm), 80GB Ultra ATA/100 (7200 rpm), 120GB Ultra ATA/100 (7200 rpm), 180GB Ultra ATA/100 (7200 rpm)		
Optical drives	SuperDrive (DVD-R/CD-RW), Combo drive (DVD-ROM/CD-RW)		
Graphics	NVIDIA GeForce4 MX with 64MB DDR SDRAM, ATI Radeon 9000 Pro with 64MB DDR SDRAM, NVIDIA GeForce4 Titanium with 128MB DDR SDRAM, ATI Radeon 9700 Pro with 128MB DDR SDRAM		
Audio	Apple Pro Speakers, Apple iPod, Harman Kardon iSub and SoundSticks		
Wireless	AirPort Extreme Card, AirPort Extreme Base Station, built-in Bluetooth module		
Other	Mac OS X Server, Ultra SCSI PCI card, DVD-R Media Kit		
Technical Specifications			



Processing and memory

- 1GHz, dual 1.25GHz, or dual 1.42GHz PowerPC G4 processors
- Velocity Engine vector processing unit
- Full 128-bit internal memory data paths
- Powerful floating-point unit supporting single-cycle, double-precision calculations
- Data stream prefetching operations supporting four simultaneous 32-bit data streams
- 256K on-chip L2 cache running at processor speed
- Up to 2MB DDR SRAM L3 cache per processor with up to 4-GBps throughput
- Up to 167MHz system bus supporting over 1.3-GBps data throughput
- 256MB or 512MB of PC2100 (266MHz) or PC2700 (333MHz) DDR SDRAM main memory supporting up to 2.7-GBps throughput
- Four DIMM slots supporting up to 2GB of DDR SDRAM using one of the following<sup>4</sup>:
  - 256MB DIMMs (64-bit-wide, 128- or 256-Mbit)
  - 512MB DIMMs (64-bit-wide, 256-Mbit)

Graphics and display support

- One of the following graphics cards installed in a dedicated AGP 4X graphics slot:
  - NVIDIA GeForce4 MX with 64MB of DDR SDRAM
  - ATI Radeon 9000 Pro with 64MB of DDR SDRAM
  - NVIDIA GeForce4 Titanium with 128MB of DDR SDRAM (build-to-order option)
  - ATI Radeon 9700 Pro with 128MB of DDR SDRAM (build-to-order option)
- Support for digital resolutions up to 1920 by 1200 pixels; analog resolutions up to 1600 by 1200 pixels
- ADC and DVI connectors; DVI to VGA adapter included
- Dual display support for extended desktop and video mirroring modes
- Support for up to two Apple displays<sup>1</sup>

Storage and expansion

- Four 3.5-inch hard drive expansion bays
  - One 7200-rpm Ultra ATA/100 drive preinstalled in standard configurations: 60GB, 80GB, or 120GB<sup>5</sup>
  - Support for up to four internal ATA drives (two Ultra ATA/100 and two Ultra ATA/66)
  - Support for up to four internal SCSI drives (requires third-party solution not offered by Apple)
  - Support for a combination of internal ATA and SCSI drives (total of four)
- One of the following optical drives:
  - SuperDrive (DVD-R/CD-RW); writes DVD-R discs at 4x speed, reads DVDs at 8x speed, writes CD-R discs at 16x speed, writes CD-RW discs at 8x speed, reads CDs at 32x speed
  - Combo drive (DVD-ROM/CD-RW); reads DVDs at 12x speed, writes CD-R discs at 32x speed, writes CD-RW discs at 10x speed, reads CDs at 32x speed
  - Optional Combo drive in second optical drive bay
- Four open full-length 64-bit, 33MHz PCI slots
- One AGP 4X slot with graphics card installed

Communications

- 10/100/1000BASE-T Ethernet connector (RJ-45)
- Built-in antennas and expansion slot for optional 54-Mbps AirPort Extreme Card (based on IEEE 802.11g draft specification; 802.11b Wi-Fi certified)<sup>2</sup>
- Built-in 56K V.92 modem<sup>6</sup>
- Optional Bluetooth 1.1 module

Peripherals and audio

- One FireWire 800 port and two FireWire 400 ports (15W total power)
- Four USB ports (two on system, two on keyboard)
- Front headphone jack and speaker
- Stereo audio line in and line out minijacks
- Apple speaker minijack for connection to optional Apple Pro Speakers

Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100Ð125V AC or 200Ð240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum current: 6.5A (low-voltage range) or 7.5A (high-voltage range)
- Operating temperature: 50i to 95i F (10i to 35i C)
- Storage temperature: Ð40i to 116i F (Ð40i to 47i C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

Size and weight

- Height: 17.0 inches (43.2 cm)
- Width: 8.9 inches (22.7 cm)
- Depth: 18.4 inches (46.8 cm)
- Weight: 42 pounds (19.1 kg)<sup>7</sup>

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

1. Second Apple flat-panel display requires Apple DVI to ADC Adapter, sold separately.  
2. Wireless Internet access requires AirPort Extreme Card, AirPort Extreme Base Station or AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions. Speeds up to 54 Mbps require AirPort Extreme Base Station.  
3. SuperDrive available in selected models.  
4. 999MB maximum per application in the Mac OS X Classic environment.  
5. 1GB = 1 billion bytes; actual formatted capacity less  
6. Appropriate ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower.  
7. Weight varies by configuration and manufacturing process.  
8. SuperDrive required for iDVD.

# Final Cut Pro 4.0.1 - Technical Specifications

## Hardware requirements

- Macintosh computer with 350 MHz PowerPC G4 processor and AGP graphics card
  - RT Extreme requires a single 500 MHz or faster PowerPC G4 (550 MHz for PowerBook G4) or any dual PowerPC G4.
  - Soundtrack requires a single 500 MHz or dual 450 MHz or faster PowerPC G4.
- 384 megabytes (MB) of random-access memory (RAM)
- A DVD drive
- A DV (digital video) source, such as a camcorder or deck, connected to your computer via a FireWire port (also known as i.LINK or IEEE 1394)
- The correct FireWire or device control cable and any additional cables you may need for connecting your deck or camcorder to your computer
- An analog video source, a Final Cut Pro-qualified video capture card or device, and an adapter cable to connect the video source to your computer

## Software requirements

- Mac OS X v10.2.5 or later
- QuickTime 6.1 or later

## Available hard disk drive space

Final Cut Pro 4 and its associated features require a certain amount of free disk space:

- 1 GB available disk space required for application installation.
- 5 GB available disk space required for Soundtrack content.
- 9 GB available disk space required for LiveType content.

Published Date: Jun 26, 2009

# Final Cut Studio 1.0 - Technical Specifications

Final Cut Studio 1.0 - Part Numbers	
Retail	<b>M9911Z/A</b>
Upgrade from Final Cut Pro	<b>M9912Z/A</b>
Upgrade from Production Suite	<b>M9911Z/A</b>
Academic	<b>M9916Z/A</b>

## Minimum Hardware Requirements

- A Macintosh computer with a PowerPC G4 (867 megahertz [MHz] or faster) or PowerPC G5 processor
  - HD features require 1 gigahertz (GHz) or faster single processor or dual processors (authoring HD DVDs requires a PowerPC G5 processor)
- 512 megabytes (MB) of random-access memory (RAM)
  - HD features require 1 gigabyte (GB) of RAM or more (2 GB recommended)
- Display with at least 1024 x 768 resolution
- AGP (Accelerated Graphics Port) Quartz Extreme graphics card
  - Motion requires the standard graphics card found in any Power Mac G5, any iMac G5, a 1.25 GHz or faster PowerBook G4, or a 1.25 GHz or faster flat-panel iMac. Any one of the following graphics cards is highly recommended:
    - NVIDIA GeForce FX 6800 Ultra DDL or 6800 GT DDL (NV40)
    - ATI Mobility Radeon 9700 (RV M11), ATI Radeon 9800 Pro (R350), or 9800 XT (R360)
- DVD drive
- Replication of DVD Studio Pro 4-authored DVDs requires a DLT drive

## Minimum Software Requirements

- Mac OS X v10.3.9 or Mac OS X v10.4 (or later)
  - Mac OS X v10.4 (or later) required to use Core Image Units and 16- and 32-bit float rendering in Motion
- QuickTime 7 (or later)
- Playback of DVD Studio Pro 4-authored HD DVDs requires a PowerPC G5 processor, Mac OS X v10.4 (or later), and Apple DVD Player 4.6 (or later)

## Available Disk Space

- 4 GB of disk space required to install all applications (Final Cut Pro, DVD Studio Pro, Soundtrack Pro, Motion, Cinema Tools, LiveType, Compressor, and Apple Qmaster)
- Additional 41 GB required to install all optional templates, loops, content, and tutorials (may be installed on separate disk[s]):
  - 8 GB for DVD Studio Pro content
  - 8 GB for Motion templates, Motion Series LiveFonts, and tutorial media
  - 8 GB for Soundtrack Pro content
  - 12 GB for LiveType content
  - 5 GB for Apple Pro Training Final Cut Studio Tutorials media

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# Safari 4 for Mac - Technical Specifications

## Macintosh Requirements

- Any Mac running Mac OS X Leopard 10.5.7 or Mac OS X Tiger 10.4.11 and Security Update 2009-002
- Mac with an Intel processor or a Power PC G5, G4, or G3 processor and built-in FireWire®
- 256MB of RAM
- Top Sites and Cover Flow on Mac OS X Tiger require a Quartz-Extreme compatible video card. [More details](#)

## What's new in Safari 4

- Top Sites
- Cover Flow
- Full History Search
- Nitro Engine
- Developer Tools
- Full-Page Zoom
- Smart Address Field
- Smart Search Field
- Phishing and Malware Protection

Published Date: Jun 18, 2009

# Safari 4 for Windows - Technical Specifications

## Windows Requirements

- Any PC running Windows XP or Windows Vista
- 500-MHz Pentium-class processor or better
- 256MB of RAM
- Top Sites and Cover Flow require a compatible DirectX 9.0 video card with 64MB of video RAM. [More details](#)

## What's new in Safari 4

- Top Sites
- Cover Flow
- Full History Search
- Nitro Engine
- Windows Native Look and Feel
- Developer Tools
- Full-Page Zoom
- Smart Address Field
- Smart Search Field
- Phishing and Malware Protection

Published Date: Jun 18, 2009

# Final Cut Pro HD - Technical Specifications

## Hardware requirements

- A Macintosh computer with a PowerPC G4 or G5 processor and AGP (Accelerated Graphics Port) graphics card
- 384 megabytes (MB) of random-access memory (RAM)
- 350 megahertz (MHz) or faster processor
- For RT Extreme, a single 500 MHz or faster PowerPC G4 (550 MHz for PowerBook G4) or any dual PowerPC G4
- To use DVCPRO HD, you must have a Power Macintosh computer with a 1 GHz or faster processor and 1 gigabyte (GB) of RAM.

Note: To use Soundtrack you must have a Power Macintosh computer with a 450 MHz or faster dual processor or a 500 MHz or faster single processor; 512 MB of RAM is also recommended.

## Software requirements

- Mac OS X v10.3.2 or later
- QuickTime 6.5 or later

## Available hard disk drive space

Final Cut Pro HD and its associated applications require a certain amount of free disk space:

- 1 GB available disk space required for application installation.
- Optional installation of all Soundtrack and LiveType content: 14 GB available disk space is necessary.

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# Shake 4.1 - Technical Specifications

Shake 4.1 - Part Numbers	
Retail	MA434Z/A
NFR	MA436Z/A

## Minimum Requirements for Desktop Systems

- Macintosh computer with 1 gigahertz (GHz) or faster PowerPC G4, PowerPC G5, or Intel Core processor
- Mac OS X v10.4.6 (or later)
- QuickTime 7.0.4 (or later)
- 512 megabytes (MB) of random-access memory (RAM)—1 gigabyte (GB) RAM or more recommended
- 1 GB of available disk space for caching and for temporary files
- 32 MB of video memory and OpenGL hardware acceleration
- Display supporting 1280 x 1024-pixel resolution and 24-bit color
- Three-button mouse
- Optional: AJA Kona or Blackmagic DeckLink card required to preview composites on a broadcast video monitor

## Minimum Requirements for Render-Only Workstations

- 500 megahertz (MHz) or higher PowerPC G4, PowerPC G5 or Intel Core processor
- Mac OS X v10.4.6 (or later)
- QuickTime 7.0.4 (or later)
- 1 GB local disk space for caching and temporary files
- 256 MB of RAM

## Features

### Compositing

- Process tree-based compositing
- Control over bit depth at a local node level
- Mix image resolutions within a composition
- 3D Multi-Plane node with camera controls
- Import Maya compatible camera tracking data
- Customizable quad split viewer
- Multi-input layer node with blend modes
- Boolean and Image Math layer operations
- Import Photoshop layers with blend modes
- Fully editable node grouping/ungrouping
- Channel swapping and copying
- Constraint of any operation to channel, field, tolerance or region
- External masking capabilities for every operator
- Audio scratch track support on Mac OS X
- Support for third-party plug-ins including The Foundry, GenArts and RE: Vision Effects

### Filters

- Film grain simulation
- Extremely fast, high-quality Gaussian blurs
- User-definable Convolves
- Grain, Median, Sharpening, Embossing, Edge Detection, Radial Blur and Z-Depth-based Blur
- Optical Defocus
- Dilation/Erosion
- Image-driven Blurring, Sharpening or Dilation
- Keying
- Included 32-bit Photron Primatte chroma keyer
- Included 32-bit CFC Keylight chroma keyer
- Chroma, Luma, Difference or Z-Depth keying
- Spill suppression

## Color Correction and Channel Manipulation

# 555\_Shake 4.1 - Technical Specifications.pdf

- Pixel Analyzer gathers image analysis data over multiple frames for use on color correction
- Curve-based color correction
- Color correction super node
- Lookup table color correction
- Extensive set of RGB, matte, Z-depth and HSV-based color correction tools
- Logarithmic/Linear color space conversion with per-channel roll-off controls
- Support for multiple color spaces including RGB, HSV, HLS, CMY and YUV
- Video-legal color correction
- Concatenation of adjacent color-corrections into one lookup table

## Warps

- Shape-based warper and morpher nodes
- New Lens warp node
- Randomization and turbulence
- Twirl and Pincushion
- Image- and expression-based warping

## Paint

- Procedural, pressure-sensitive vector-based paint
- Insert Paint nodes anywhere in the process tree
- Clone, reveal and smudge paint modes
- Apply tracking data to paint strokes
- View Paint strokes in context of transforms
- Switch interpolation modes at any time: single frame, persistent and frame to frame interpolation

## Animation

- Animate virtually any slider or toggle
- Flexible split window animation curve editing
- Automatic or manual key framing
- Copy/Paste Key frames
- View audio wave forms against animation curves
- Drive parameter animation based on audio
- Overlapping Key controls for moving, interpolating and replacing control vertices
- Curve controls for maintaining keyframe slopes and values over a range of frames
- Resample function
- Linking of any parameter to any other parameter
- Expressions on any parameter

## Engine

- Optical flow-based retiming
- Open EXR, Cineon and DPX support
- 10-bit and 16-bit QuickTime support
- Apple Uncompressed 8- and 10-bit 4:2:2 support
- 15 other image file formats supported
- Support for custom file header metadata
- Hybrid tile-based, scan line renderer
- True per-node control of bit-depth, at 8, 16 or 32 bits per channel (float)
- Domain of Definition processing optimization
- Disk-based or on-the-fly proxy system
- Anamorphic image support
- Macro creation for frequently used operations
- Automatic persistent node caching
- C-like scripting language can make calls to any locally available shared programming library
- Built-in runtime compiler
- Built-in software-based GL-like renderer
- Software Developer Kit for software extensibility
- Command-line scripting access to all commands
- 100% software-based rendering for visually identical results cross platform
- Generation of anti-aliased text using TrueType and Adobe Type 1 fonts

## Rotoscoping

- Multiple Bezier style Rotoshapes per node



# 555\_Shake 4.1 - Technical Specifications.pdf

- Independent animation control
- Non-uniform edge blurring
- Apply tracking data to Rotoshapes and points
- Non-uniform, velocity-based motion blur
- Shape parenting

## Transformations

- Infinite workspace, so elements and filters are never cropped when moved out of frame
- Pan, Rotate, Scale, Shear and Corner Pin
- Tracker, stabilizer and Matchmove nodes
- New Smoothcam optical flow based stabilization
- Tracker pre-processing reduces inaccuracies
- New Auto-align
- Optical flow-based resizing
- Concatenation of adjacent transformations into a single move, for speed and quality
- Per-transformation or global Motion Blur control
- Motion blur with shutter and quality control
- Apply Motion blur initial frame setting
- Ability to control transformation order
- Inverse transformations
- In-context direct manipulation controls

## Interface

- Preview composites on broadcast monitors using third-party supported Mac OS X hardware
- On-screen manipulators for transformations
- Multiple resolution or channel viewers
- Integrated Truelight Monitor calibration
- RAM flipbook for viewing of compositing tree at any stage; flipbook playback while rendering
- RAM Flipbook playback while rendering
- QuickTime disk-based flipbook on Mac OS X
- Viewer-specific lookup tables
- In-viewer region of interest
- In-viewer image compare buffer

## Apple Qmaster

- Network render management for Mac OS X
- Integrated UI for job creation and monitoring
- Integrated Maya rendering support
- Offloading processor intensive tasks to other computers
- Create multiple clusters of Mac or Xserve systems for specific jobs, artists or applications
- Fault-tolerant architecture ensures successful job completion and accurate results, even in the event of resource deallocation
- Optimized usage of network resources through load-balancing algorithms
- Compatible with third-party command line rendering applications running on Mac OS X

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# Final Cut Server - Technical Specifications

Final Cut Server - Part Numbers	
Retail Unlimited Clients	MA997Z/A
Retail 10 Clients	MA998Z/A
Upgrade 10 to Unlimited Clients	MA999Z/A

## Server: Minimum Hardware Requirements to Install All Final Cut Server Applications

- A Macintosh computer with a 1.8 gigahertz (GHz) or faster PowerPC G5, Intel Core Duo, Intel Core 2 Duo, or Intel Xeon processor
- 2 gigabytes (GB) of random-access memory (RAM)
- Accelerated Graphics Port (AGP) or PCI Express Quartz Extreme graphics card. Final Cut Server is not compatible with Integrated Intel Graphics processors.
- A CD drive for installation

## Server: Recommended Hardware Requirements to Install All Final Cut Server Applications

- Intel Core Duo, Intel Core 2 Duo, or Intel Xeon processor
- 4 GB of RAM
- Accelerated Graphics Port (AGP) or PCI Express Quartz Extreme graphics card. Final Cut Server is not compatible with Integrated Intel Graphics processors.
- A CD drive for installation

## Client: Minimum Macintosh Hardware Requirements to Install All Final Cut Server Applications

- A Macintosh computer with a 1.25 GHz or faster PowerPC G4, PowerPC G5, Intel Core Duo, Intel Core 2 Duo, or Intel Xeon processor
- 1 GB of RAM
- A display with 1024 x 768 resolution or higher
- 20 megabytes (MB) of available disk space (after installation)

## Client: Minimum PC Hardware Requirements to Install All Final Cut Server Applications

- A PC computer with Windows XP SP 2 or Windows Vista
- 1 GB of RAM
- A display with 1024 x 768 resolution or higher
- 20 MB of available disk space (after installation)

## Minimum Software Requirements - Server

- Mac OS X v10.5 (or later)
- QuickTime 7.4.1 (or later)

## Minimum Software Requirements - Client Mac

- Mac OS X v10.4.11 (or later)
- QuickTime 7.4.1 (or later)
- Final Cut Pro 6.0.2 (or later) for Final Cut Pro integration
- Java for Mac OS X 10.4, Release 6 (or later)

## Minimum Software Requirements - Client Windows

- Windows XP SP2 or Windows Vista
- QuickTime 7.4.1 (or later)
- Java SE Runtime Environment (JRE) 6, Update 4 (or later)

## Available Disk Space

- 500 MB of disk space required to install all applications

# Aperture 1.5 - Technical Specifications

## Minimum Hardware Requirements

- One of the following Macintosh computers:
  - Mac Pro
  - 15- or 17-inch MacBook Pro
  - MacBook
  - Mac mini with Intel Core Solo or Duo processor
  - iMac with a 1.8 GHz or faster PowerPC G5 or Intel Core Duo processor
  - Power Mac G5 with a 1.6 GHz or faster PowerPC G5 processor
  - 15- or 17-inch PowerBook G4 with a 1.25 GHz or faster PowerPC G4 processor
- 1 GB of random-access memory (RAM)
  - 2 GB of RAM required for Mac Pro
- One of the following graphics cards:
  - ATI Radeon X600 Pro, X600 XT, X800 XT Mac Edition, X850 XT, X1600, X1900 XT, 9800 XT, 9800 Pro, 9700 Pro, 9600, 9600 XT, 9600 Pro, or 9650
  - ATI Mobility Radeon 9700, 9600
  - ATI Mobility X1600
  - NVIDIA GeForce FX 5200 Ultra, 6600, 6600 LE, 6800 Ultra DDL, 6800 GT DDL, 7300 GT, 7800 GT
  - NVIDIA Quadro FX 4500
  - Intel GMA950
- DVD drive for installation

## Minimum Software Requirements

- Mac OS X v10.4.8 (or later)

## Recommended Configuration

- Macintosh computer with a 2 GHz or faster Intel Core Duo processor or dual 2 GHz or faster PowerPC G5 processors
- 2 GB of RAM
- One of the following graphics cards:
  - ATI Radeon X800 XT Mac Edition, 9800 XT, 9800 Pro, X1900 XT, or X1600
  - NVIDIA GeForce 6800 series, 7800 GT, or Quadro FX 4500

## Available Hard Disk Space

Aperture and its associated features require a certain amount of available disk space:

- 5 GB of disk space for the application, sample projects, and tutorial

Published Date: Jun 25, 2009

# DVD Studio Pro 3 - Technical Specifications

DVD Studio Pro 3 - Part Numbers	
Retail	<b>M9498Z/A</b>
Upgrade from DVD Studio Pro	<b>M9541Z/A</b>

## Minimum hardware requirements

- A Macintosh computer with a 733 megahertz (MHz) or faster PowerPC G4 processor with an AGP graphics card
- 8 megabytes (MB) of video memory (32 MB recommended)
- 256 MB of RAM (512 MB recommended)
- For application installation: DVD drive, 4.4 gigabytes (GB) of disk space
- For writing finished projects to disc: Apple SuperDrive or other DVD recorder
- For transporting projects on tape to a replicator (suggested for DVD-9 projects): DLT drive
- For transporting projects on disc that contain copy-protection or dual-layer features to a replicator: Authoring DVD drive

## Minimum software requirements

- Mac OS X v10.3.2 or later
- QuickTime 6.5 or later

## Source material requirements

- Edited video files in MPEG-1, MPEG-2, or QuickTime format
- Edited audio files in PCM, AIFF, MPEG-1 Layer 2, AC-3, DTS, or QuickTime format
- Video creation or editing software, such as Final Cut Pro, or any video and audio editing programs that support QuickTime

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# Aperture 1.0 - Technical Specifications

## Minimum Hardware Requirements

- One of the following Macintosh computers:
  - Power Mac G5 with a 1.8 gigahertz (GHz) or faster PowerPC G5 processor
  - 17- or 20-inch iMac G5 with a 1.8 GHz or faster PowerPC G5 processor
  - 15- or 17-inch PowerBook G4 with a 1.25 GHz or faster PowerPC G4 processor
- 1 gigabyte (GB) of random-access memory (RAM)
- Display with 1280 x 854 or higher resolution
- One of the following graphics cards:
  - ATI Radeon X800 XT Mac Edition, X850 XT, 9800 XT, 9800 Pro, 9700 Pro, 9600 XT, 9600 Pro, or 9650
  - ATI Mobility Radeon 9700 or 9600
  - NVIDIA GeForce 6600, 6600 LE, 6800 Ultra DDL, 6800 GT DDL, or 7800 GT
  - NVIDIA Quadro FX 4500
- DVD drive for installation

## Minimum Software Requirements

- Mac OS X v10.4.3 (or later)

## Recommended Configuration

- Power Mac G5 with dual 2 GHz or faster PowerPC G5 processors
- 2 GB of RAM
- One of the following graphics cards:
  - ATI Radeon X800 XT, 9800 XT, or 9800 Pro
  - NVIDIA GeForce 6800 or Quadro FX 4500

## Available Hard Disk Space

Aperture and its associated features require a certain amount of available disk space:

- 5 GB of disk space for the application and sample projects

Published Date: Jun 25, 2009

# AirPort Extreme Base Station (Modem and PoE/UL2043 models) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## AirPort Extreme Base Station (Modem and PoE/UL2043 models) - Technical Specifications

Configurations		
Order number	AirPort Extreme Base Station (with modem and antenna port)	AirPort Extreme Base Station (with Power over Ethernet support and conformance to UL 2043) — Available for Education M9397LL/A
Wireless protocol (1)	802.11g	802.11g
Users supported	50	50
10/100BASE-T Ethernet WAN port	Yes	Yes
10/100BASE-T Ethernet LAN port	Yes	Yes
Wireless bridging (2)	Yes	Yes
USB port (3)	Yes	Yes
Internal antenna	Yes	Yes
External antenna connector (4)	Yes	Yes
56K V.90 modem (5)	Yes	No
Power over Ethernet (IEEE 802.3af) support(6)	No	Yes
Conformance to UL 2043	No	Yes
Service and support	90 days of free telephone support and one-year limited warranty	

Configurations		
Order number	AirPort Extreme Card M8881LL/A	AirPort Card M7600LL/E
Wireless protocol (1)	802.11g	802.11b
Service and support	90 days of free telephone support and one-year limited warranty	

Additional Information	
System Requirements	<p><b>For Macintosh users:</b></p> <p>Computer hardware:</p> <ul style="list-style-type: none"><li>■ A Macintosh computer with an AirPort Extreme Card or AirPort Card</li></ul> <p>Users with Mac OS X v10.3 or later can:</p> <ul style="list-style-type: none"><li>■ Access an AirPort wireless network</li><li>■ Set up an AirPort Extreme Base Station</li><li>■ Share a USB printer</li><li>■ Use Wi-Fi Protected Access (WPA)</li><li>■ Use the AirPort Client Monitor and AirPort Management Utility (Education and Business use)</li></ul> <p>Users with Mac OS X v10.2.7 can:</p> <ul style="list-style-type: none"><li>■ Access an AirPort wireless network</li><li>■ Set up an AirPort Extreme Base Station</li><li>■ Share a USB printer</li></ul> <p><b>For PC users:</b></p> <ul style="list-style-type: none"><li>■ A PC with a Wi-Fi-certified IEEE 802.11b or 802.11g wireless card</li><li>■ Windows XP or Windows 2000</li><li>■ WPA support requires a Wi-Fi-certified PC solution</li></ul>
Extended Service and Support	Purchase the <a href="#">AppleCare Protection Plan</a> to extend the service and support for AirPort Card or AirPort Extreme Card and AirPort Extreme Base Station.

### Technical Specifications

55\_AirPort Extreme Base Station (Modem and PoE-UL2043 models) - Technical Specifications

Wireless data rates (1)

- Up to 54 Mbps for AirPort Extreme-enabled and other Wi-Fi Certified 802.11g computers (data rate depends on environment)
- Up to 11 Mbps for AirPort-enabled and other Wi-Fi 802.11b-enabled computers (data rate depends on environment)

Range (2)

- 50-foot range from the base station in typical use at 54 Mbps data rate (range depends on building construction) (1)
- 150-foot range from the base station in typical use at 11 Mbps data rate (range depends on building construction)

Frequency band

- 2.4GHz

Radio output power

- 15dBm

Size and weight

- Diameter: 6.9 inches (175mm)
- Height: 3.2 inches (80mm)
- Weight (without wall mounting bracket): 1.25 pounds (565grams) (7)

Position options

- Desktop or wall (wall mounting bracket included)
- Air-handling space (available on one model)

More Information

[AirPort Extreme](#)

[AirPort Extreme Easy Setup](#)

Compatibility

- Wi-Fi Certified for 802.11b and 802.11g interoperability (1)
- Mac computers and Windows-based PCs
- NAT, DHCP, FTP, PPPoE, VPN Passthrough (IPSec, PPTP and L2TP), PPP client and server (AirPort Extreme with modem only), QuickTime Streaming, DNS Proxy, SNMP
- America Online (9)
- Cisco LEAP client support to connect to Cisco LEAP access points.

Interfaces

- 10/100BASE-T Ethernet WAN port (RJ-45 connector) for connecting a DSL or cable modem
- 10/100BASE-T Ethernet LAN port (RJ-45 connector) for connecting to wired computers and printers
- USB port for connecting a USB printer(3)
- 56K V.90 modem (RJ-11 connector) for dialup Internet connections (5)
- External antenna connector for connecting external directional or omnidirectional antennas
- Power port for included power adapter

Security

- Wi-Fi Protected Access™ (WPA) (9)
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS

Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, ARIB STD-T66, RCR STD-T33, AS/NZS 4771:2000, UL 60950, CSA-C22.2 No. 60950
- Conforms to UL 2043 for use in air-handling spaces (available on one model of the AirPort Extreme Base Station)

Included software AirPort Extreme Base Station software:

- AirPort Setup Assistant to configure the computer and base station for Internet access
- AirPort Admin Utility for base station setup and network administration
- AirPort Client Monitor to gauge the signal quality of a base station at various locations (for education and business use; included with one model)
- AirPort Management Utility to administer groups of base stations efficiently (for education and business use; included with one model)

AirPort Card software:

- Internet Connect to connect to and disconnect from your ISP, monitor connection status, turn AirPort Extreme on and off, change networks, and check signal quality
- AirPort menu bar status icon to monitor connection status, measure signal quality, change networks, and turn AirPort on and off

Electrical and environmental requirements

- 100-240V AC, 50-60Hz, Input Current: 0.4 Amps (AirPort Extreme Base Station)
- 100-240V AC, 50-60Hz, Input Current: 0.2 Amps (AirPort Express Base Station)
- Power over Ethernet: IEEE 802.3af PD, Class 0 (available on one model of the AirPort Extreme Base Station)
- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13°to 140° F ( -25° to 60° C)
- Relative humidity (operating): 20% to 90%, noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

Channels

- Channels 1-11 approved for use in the United States, Canada, Latin America, and Taiwan
- Channels 1-14 approved for use in Japan
- Channels 1-13 approved for use in other countries

1. AirPort Extreme uses the 802.11g wireless standard. Accessing the wireless network requires an AirPort or AirPort Extreme enabled computer or Wi-Fi-certified 802.11b or 802.11g computer. Achieving data rates of 54 Mbps requires that all users have an AirPort Extreme or Wi-Fi-certified 802.11g enabled computer and connect to an AirPort Express or AirPort Extreme Base Station. If a user of a Wi-Fi-certified 802.11b product joins the network, that user will get up to 11 Mbps and AirPort Extreme and Wi-Fi-certified 802.11g users will get less than 54 Mbps. Actual speed will vary based on range, connection rate, site conditions, size of network, and other factors.
2. AirPort Extreme can extend the range only of an AirPort Extreme or AirPort Express wireless network.
3. Wireless printing over USB requires Mac OS X v10.2.7 or later or Windows XP or Windows 2000 and a compatible printer.
4. For use with Apple-approved antennas only. Antennas sold separately.
5. Actual modem speeds lower; speed depends on connection rate and other factors.
6. Power over Ethernet (PoE) requires a compatible IEEE 802.3af PSE. USB port is disabled when PoE is in use.
7. Weight varies by configuration and manufacturing process.
8. Compatible with AOL 5.0 or later in the U.S. only. Simultaneous sharing of an AOL connection requires multiple AOL accounts.
9. Support for WPA requires Mac OS X v10.3 or later. Use of Wi-Fi Protected Access (WPA) reduces the maximum number of network users.

Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort Extreme.

Product specifications are subject to change without notice.

# DVD Studio Pro 1.5 - Technical Specifications

## System Software Requirements

### Mac OS 9 version

- Mac OS 9.2.2 or later (included on the DVD Studio Pro disc)
  - QuickTime 5.0.5 (included on the DVD Studio Pro disc)
  - DVD Player 2.7 (installed as part of the Mac OS 9 Update to 9.2.2, included on the DVD Studio Pro disc)
  - Final Cut Pro 3.0.2 (required only if you want to access the chapter and compression marker creation feature)
1. You cannot install DVD Studio Pro 1.5 for Mac OS 9 while working in the Classic environment.
  2. For instructions on upgrading to the required version of the Mac OS, refer to the flyer, "Upgrading to Mac OS 9.2.2 or Mac OS X v10.1.3," included with your DVD Studio Pro 1.5 DVD.
  3. Before you install DVD Studio Pro 1.5, QuickTime Pro must be installed and unlocked.

### Mac OS X version

- Mac OS X v10.1.3 or later
  - QuickTime 5.0.5 (included with the Mac OS X v10.1.3 upgrade)
  - DVD Player 3.1 (included on the DVD Studio Pro disc)
  - Final Cut Pro 3.0.2 (required only if you want to access the chapter and compression marker creation feature)
1. Restrictions for writing DVD discs using a Pioneer S201 DVD-R drive: You cannot burn DVD discs with a Pioneer S201 DVD-R drive using DVD Studio Pro 1.5 for Mac OS X v10.1.3. If you've created a project using the Mac OS X version of DVD Studio Pro 1.5, you can open and burn the project to disc using the Mac OS 9 version of DVD Studio Pro 1.5, which supports the Pioneer S201 drive. Future versions of Mac OS X will support use of the Pioneer S201 drive.
  2. Before you install DVD Studio Pro 1.5, QuickTime Pro must be installed and unlocked.

## Final Cut Pro compression and chapter marker support

- To take advantage of DVD Studio Pro's ability to recognize Final Cut Pro chapter and compression markers, you must be using Final Cut Pro 3.0.2 or later. See "What is New in DVD Studio Pro", located in the Documentation folder on the DVD Studio Pro disc, for more information.

Published Date: Jun 26, 2009



# DVD Studio Pro 1.0 - Technical Specifications

## System requirements

- A Macintosh with a G4 processor and an Apple-supplied AGP graphics card
- Mac OS 9.0.4 or 9.1
- QuickTime 4.1 (included on DVD Studio Pro CD) or later
- 128 megabytes of RAM
- A DVD drive
- Display software and hardware capable of 1024 x 768 pixels at thousands or millions of colors
- For writing to disc: DVD-R recorder, DVD-RAM drive, or DLT tape drive

## Software requirements

- Apple DVD Player 2.3 or later (installed with the DVD Studio Pro software)
- Edited video and audio files in MPEG or AC-3 format; or video creation and editing software, such as Final Cut Pro or any video and audio editing programs that support QuickTime and its component technology
- MPEG encoding software, such as the QuickTime MPEG Encoder included with DVD Studio Pro. (You can also use any MPEG encoder, software or hardware based, that produces DVD-compliant streams.)
- Adobe Photoshop (version 4.0 or later) for creating menus and buttons
- QuickTime Pro must be installed and unlocked.

## Hard disk requirements

- You should have at least twice as much hard disk storage space as the size of your project. (For DVD-5, for example, you need 5 gigabytes [GB] for the source files, and another 5 GB to hold the multiplexed project.) For best multiplexing performance, dedicate two or three Ultra Wide A/V or FireWire hard disks to your project (make sure they contain only your media and no other programs that might fragment the disk and decrease performance).
- If you have three disks, use one for video assets, one for audio assets, and the third for the finished files.
- If you have two disks, use one for source assets and one for final files.

Published Date: Jun 26, 2009

# DVD Studio Pro 2.0 - Technical Specifications

## System requirements

- A Macintosh with a G4 processor and an Apple-supplied AGP graphics card
- 733 megahertz (MHz) or faster processor
- 8 megabytes (MB) of video memory (32 MB recommended)
- 256 MB of random-access memory (RAM) (512 MB recommended)
- For application installation: DVD drive, 20 gigabytes (GB) of disk space
- For writing finished projects to disc: Apple SuperDrive or DVD-R recorder
- For transporting projects on tape to a replicator (suggested for DVD-9 projects): DLT drive
- For transporting projects on disc that contain copy-protection or dual-layer features to a replicator: Authoring DVD drive

## Software requirements

- Mac OS X v10.2.6
- QuickTime 6.3
- QuickTime Pro must be installed and unlocked.
- Edited video files in MPEG-1, MPEG-2, or QuickTime format
- Edited audio files in PCM, AIFF, MPEG-1 Layer 2, AC-3, or QuickTime format
- Video creation or editing software, such as Final Cut Pro, or any video and audio editing programs that support QuickTime

Published Date: Jun 26, 2009

# iPhone 3GS - Technical Specifications

## Size and weight<sup>1</sup>

Height:  
4.5 inches (115.5 mm)  
Width:  
2.4 inches (62.1 mm)  
Depth:  
0.48 inch (12.3 mm)  
Weight:  
4.8 ounces (135 grams)

## Cellular and wireless

- UMTS/HSDPA (850, 1900, 2100 MHz)
- GSM/EDGE (850, 900, 1800, 1900 MHz)
- 802.11b/g Wi-Fi
- Bluetooth 2.1 + EDR wireless technology

## Location

- Assisted GPS
- Digital compass
- Wi-Fi
- Cellular

## Power and battery<sup>2</sup>

- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter
- Talk time:  
Up to 5 hours on 3G  
Up to 12 hours on 2G
- Standby time: Up to 300 hours
- Internet use:  
Up to 5 hours on 3G  
Up to 9 hours on Wi-Fi
- Video playback: Up to 10 hours
- Audio playback: Up to 30 hours

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.5.8 or later
- iTunes 9.2 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))
- iTunes Store account
- Internet access

## Windows system requirements

- PC with USB 2.0 port
- Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
- iTunes 9.2 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))
- iTunes Store account
- Internet access

## Environmental requirements

# 565\_iPhone 3GS - Technical Specifications.pdf

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Capacity<sup>3</sup>

- 8GB flash drive

## Color

- Black

## Display

- 3.5-inch (diagonal) widescreen Multi-Touch display
- 480-by-320-pixel resolution at 163 ppi
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously

## Audio playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and video

- Video formats supported: H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- Support for 576p and 480p with Apple Component AV Cable; 576i and 480i with Apple Composite AV Cable (cables sold separately)

## Languages

- Language support for English (U.S.), English (UK), French (France), German, Traditional Chinese, Simplified Chinese, Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese, Russian, Polish, Turkish, Ukrainian, Hungarian, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, Croatian, Catalan, and Vietnamese
- Keyboard support for English (U.S.), English (UK), French (France), French (Canadian), French (Switzerland), German, Traditional Chinese (Handwriting, Pinyin, Zhuyin, Cangjie, Wubihua), Simplified Chinese (Handwriting, Pinyin, Wubihua), Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese (Romaji), Japanese (Kana), Russian, Polish, Turkish, Ukrainian, Estonian, Hungarian, Icelandic, Lithuanian, Latvian, Flemish, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, Croatian, Bulgarian, Serbian (Cyrillic/Latin), Catalan, and Vietnamese
- Dictionary support (enables predictive text and autocorrect) for English (U.S.), English (UK), French, German, Traditional Chinese, Simplified Chinese, Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese (Romaji), Japanese (Kana), Russian, Polish, Turkish, Ukrainian, Hungarian, Lithuanian, Flemish, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malaysian, Romanian, Slovak, Croatian, Catalan, and Vietnamese

## Mail attachment support

- Viewable document types: .jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel)

## Camera, photos, and video

- Video recording, VGA up to 30 frames per second with audio
- 3-megapixel still camera
- Tap to focus
- Photo and video geotagging

## External buttons and controls

- Sleep/wake
- Ring/silent
- Volume up/down
- Home

## Connectors and input/output

- 30-pin dock connector
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Microphone
- SIM card tray

## Sensors

- Accelerometer
- Proximity sensor
- Ambient light sensor

## Headphones

- Apple Earphones with Remote and Mic
- Volume control
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## In the box

- iPhone 3GS
- Apple Earphones with Remote and Mic
- Dock Connector to USB Cable
- USB Power Adapter
- Documentation

## Environmental Status Report

iPhone 3GS embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- PVC-free handset
- PVC-free headphones
- PVC-free USB cable
- Bromine-free printed circuit boards
- Mercury-free LCD display
- Arsenic-free display glass
- Majority of packaging made from post-consumer recycled fiberboard and biobased materials
- Power adapter outperforms strictest global energy efficiency standards

## Accessories

### Apple In-Ear Headphones with Remote and Mic

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing.

### Apple Earphones with Remote and Mic

These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.

### Apple USB Power Adapter

Use this ultracompact USB-based adapter to charge your iPhone whenever it's not connected to a computer.

- Apple Universal Dock
- Apple Dock Connector to USB Cable
- iPhone 3G Universal Dock Adapter 3-Pack
- iPhone TTY Adapter

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- Apple Component AV Cable
  - Apple Composite AV Cable
  - AirPort Extreme Base Station
  - Nike + iPod Sensor
  - World Travel Adapter Kit
- 

1. Actual size and weight vary by configuration and manufacturing process.
2. All battery claims depend on network configuration and many other factors; actual results will vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced by an Apple service provider. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. For more details of iPhone performance tests for talk time, standby time, Internet use over 3G, Internet use over Wi-Fi, video playback, and audio playback, see [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html).
3. 1GB = 1 billion bytes; actual formatted capacity less.

Published Date: Jul 26, 2017

# Logic Studio (2009) - Technical Specifications

## Minimum requirements to install all applications

- Mac computer with an Intel processor
- 1GB of RAM (2GB or more highly recommended)
- Display with 1280-by-800 or higher resolution
- Mac OS X v10.5.7 or later
- QuickTime 7.6 or later
- DVD drive for installation
- PCI Express, ExpressCard/34, USB, or FireWire-based audio interface recommended

## Additional recommendations for Logic Pro 9

- At least 2GB of RAM for large EXS instruments
- USB musical keyboard (or suitable MIDI keyboard and interface) for instruments
- Logic Node requires a Mac computer with an Intel Core processor
- Logic Pro 9.1 and MainStage 2.1 require Mac OS X v10.6.2 or later and an Intel Core 2 Duo processor to run in 64-bit mode.

## Available disk space

- 9GB to install all applications and required content
- Additional 38GB to install all optional content (large content packages can be installed on separate disk):
  - 10GB for Jam Pack collections
  - 16GB for sound effects
  - 6GB for surround music beds
  - 6GB for other optional content

## Contents

- DVD containing Logic Pro 9, MainStage 2, Soundtrack Pro 3, Studio Instruments, Studio Effects, WaveBurner 1.6, Compressor 3.5, Impulse Response Utility, Apple Loops Utility, QuickTime 7 Pro, and required contents
- Six content DVDs containing Jam Pack collections, sound effects, surround music beds, EXS24 samples, and impulse response files
- Demo Content DVD
- Printed and electronic documentation

Published Date: Jul 6, 2011

# iPod nano (5th generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:

3.6 inches (90.7 mm)

Width:

1.5 inches (38.7 mm)

Depth:

0.24 inch (6.2 mm)

Weight:

1.28 ounces (36.4 grams)<sup>1</sup>

## Capacity

- 8GB or 16GB flash drive<sup>2</sup>
- Holds up to 2,000 or 4,000 songs in 128-Kbps AAC format<sup>3</sup>
- Holds up to 7,000 or 14,000 iPod-viewable photos<sup>4</sup>
- Holds up to 8 hours or 16 hours of video<sup>5</sup>
- Stores data via USB flash drive

## Accessibility

- Spoken menus allow listeners to hear many of the names of menus, song titles, and artists without viewing the screen.
- An alternative large font can make menus easier to read.
- A high-resolution LCD display with adjustable contrast and backlight settings makes it easier to read in low light.
- Captions in video are displayed when they are present using a legible, high-contrast white-on-black font.

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Environmental Status Report

iPod nano embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Arsenic-free glass
- BFR-free
- Mercury-free
- PVC-free
- Highly recyclable

## Display

- 2.2-inch (diagonal) TFT display
- 240-by-376-pixel resolution at 204 pixels per inch

## VoiceOver Kit

- Chinese (Cantonese)
- Chinese (Mandarin)
- Czech
- Danish
- Dutch
- English
- Finnish
- French
- German
- Greek



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- Italian
- Japanese
- Korean
- Norwegian
- Polish
- Portuguese
- Russian
- Spanish
- Swedish
- Turkish

## Audio

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Languages

- Arabic, Brazilian Portuguese, Cantonese (Traditional Chinese), Croatian, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Romanian, Russian, Simplified Chinese, Slovak, Spanish, Swedish, Thai, Traditional Chinese, Turkish, and UK English
- Additional language support for display of song, album, and artist information: Bulgarian, Serbian, Slovenian, Ukrainian, and Vietnamese
- iPod nano supports 20 VoiceOver languages:  
Chinese (Cantonese), Chinese (Mandarin), Czech, Danish, Dutch, English (U.S.), Finnish, French, German, Greek, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, and Turkish; other languages are available with the purchase of a supported third-party text-to-speech engine
- iPod nano supports 20 spoken menu languages:  
Chinese (Cantonese), Chinese (Mandarin), Czech, Danish, Dutch, English (U.S.), Finnish, French, German, Greek, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, and Turkish; other languages are available with the purchase of a supported third-party text-to-speech engine

## Video Capture

- H.264 VGA video, 640 by 480 pixels, up to 30 frames per second with AAC audio
- 15 real-time special effects: Sepia, Black and White, X-Ray, Film Grain, Thermal, Security Cam, Cyborg, Bulge, Kaleido, Motion Blur, Mirror, Light Tunnel, Dent, Stretch, and Twirl

## External buttons and controls

- Hold switch
- Click Wheel

## Input and output

- Dock connector
- 3.5-mm stereo headphone jack

## Battery and power<sup>6</sup>

- Built-in rechargeable lithium-ion battery
- Playback time
  - Music playback time: Up to 24 hours when fully charged
  - Video playback time: Up to 5 hours when fully charged
- Charging via USB to computer system or power adapter (sold separately)
  - Fast-charge time: about 1.5 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 3 hours

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.11 or later
- iTunes 9 or later<sup>7</sup>
- iPhoto 6.0.6 or later recommended for use with Mac OS X Tiger<sup>8</sup>
- iPhoto '09 recommended for use with Mac OS X Leopard or Snow Leopard<sup>8</sup>

## Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 3 or later
- iTunes 9 or later<sup>7</sup>

## In the box

- iPod nano
- Earphones
- USB 2.0 cable
- Dock adapter
- Quick Start guide

## Accessories

- **In-Ear Headphones with Remote and Mic**  
Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing.
- **USB Power Adapter**  
Use this ultracompact USB-based adapter to charge your iPhone or iPod whenever it's not connected to a computer.
- **Earphones with Remote and Mic**  
These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.
- **Universal Dock with Remote**  
Get easy access to a USB port for charging and syncing your iPod or for connecting to a TV or speakers.
- **Apple Composite AV Cable**
- **Apple Component AV Cable**
- **Apple Dock Connector to USB Cable**
- **iPod Universal Dock Adapter 3-Pack**

- 
1. Weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Song capacity is based on 4 minutes per song and 128-Kbps AAC encoding; in 256-Kbps AAC format, song capacity is up to 1,000 songs (8GB) or 2,000 songs (16GB); actual capacity varies by encoding method and bit rate.
  4. Photo capacity is based on iPod-viewable photos transferred from iTunes.
  5. Video capacity is based on H.264 1.5-Mbps video at 640-by-480 resolution combined with 128-Kbps audio; actual capacity varies by content.
  6. Testing conducted by Apple in August 2009 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (128-Kbps AAC). Video content was purchased from the iTunes Store. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  7. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.
  8. iPhoto 6.0.6 or later for importing video; iPhoto '09 v8.1 or later for Faces support.

Published Date: Apr 6, 2016

# Apple Studio Display LCD (ADC) (15") - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Apple Studio Display LCD (ADC) (15") - Technical Specifications

Physical		Power	
Introduced:	7/19/2000	Max Watts:	50
Discontinued:	n/a	Amps:	
Tube Size:	15"	BTU per Hr:	171
Viewable Size:	15"	Voltage:	n/a
Tube Type:	LCD	Freq Range:	n/a Hz
Weight (lbs):	11.5		
Dimensions (in):	15.8 H x 16.1 W x 6.7 D		

Published Date: Apr 6, 2016

# iPod touch (3rd generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:

4.3 inches (110 mm)

Width:

2.4 inches (61.8 mm)

Depth:

0.33 inch (8.5 mm)

Weight:

4.05 ounces (115 grams)<sup>1</sup>

## Capacity

- 32GB or 64GB flash drive<sup>2</sup>
- Holds up to 7,000 or 14,000 songs in 128-Kbps AAC format<sup>3</sup>
- Holds up to 40,000 or 90,000 iPod-viewable photos<sup>4</sup>
- Holds up to 40 hours or 80 hours of video<sup>5</sup>

## Wireless<sup>6</sup>

- Wi-Fi (802.11b/g)
- Nike + iPod support built in
- Maps location-based service<sup>7</sup>
- Bluetooth 2.1 + EDR

## In the box

- iPod touch
- Apple Earphones with Remote and Mic
- USB 2.0 cable
- Dock adapter
- Quick Start guide

## Environmental Status Report

iPod touch embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- BFR-free
- Mercury-free LED-backlit display
- PVC-free
- Highly recyclable stainless steel enclosure

## Display

- 3.5-inch (diagonal) widescreen Multi-Touch display
- 480-by-320-pixel resolution at 163 pixels per inch

## Audio

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, AIFF, and WAV

## Headphones

- Apple Earphones with Remote and Mic

# 570\_iPod touch (3rd generation) - Technical Specifications.pdf

- Volume control
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## TV and video

- Support for 480p and 576p component TV out
- H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

## Languages

- Language support for English (U.S.), English (UK), French (France), German, Traditional Chinese, Simplified Chinese, Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese, Russian, Polish, Turkish, Ukrainian, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, and Croatian
- Keyboard support for English (U.S.), English (UK), French (France), French (Canadian), French (Switzerland), German, Traditional Chinese (Handwriting, Pinyin, Zhuyin), Simplified Chinese (Handwriting, Pinyin), Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese (QWERTY), Japanese (Kana), Russian, Polish, Turkish, Ukrainian, Estonian, Hungarian, Icelandic, Lithuanian, Latvian, Flemish, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, Croatian, Bulgarian, and Serbian
- Dictionary support (enables predictive text and autocorrect) for English (U.S.), English (UK), French, German, Traditional Chinese (Handwriting, Pinyin, Zhuyin), Simplified Chinese (Handwriting, Pinyin), Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese (QWERTY), Japanese (Kana), Russian, Polish, Turkish, Ukrainian, Lithuanian, Arabic, Thai, Czech, Greek, Hebrew, Romanian, Slovak, and Croatian

## Input and output

- Dock connector
- 3.5-mm stereo headphone jack

## External buttons and controls

- Sleep/wake
- Volume up/down
- Home

## Battery and power<sup>8</sup>

- Built-in rechargeable lithium-ion battery
- Playback time
  - Music playback time: Up to 30 hours when fully charged
  - Video playback time: Up to 6 hours when fully charged
- Charging via USB to computer system or power adapter (sold separately)
  - Fast-charge time: about 2 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 4 hours

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.11 or later
- iTunes 9 or later<sup>9</sup>

## Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 3 or later
- iTunes 9 or later<sup>9</sup>

## Environmental requirements

- Operating temperature: 32° to 95° F  
(0° to 35° C)

# 570\_iPod touch (3rd generation) - Technical Specifications.pdf

- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Accessories

### In-Ear Headphones with Remote and Mic

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing.

### USB Power Adapter

Use this ultracompact USB-based adapter to charge your iPhone or iPod whenever it's not connected to a computer.

### Earphones with Remote and Mic

These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.

### Universal Dock with Remote

Get easy access to a USB port for charging and syncing your iPod or for connecting to a TV or speakers.

- Apple Composite AV Cable
- Apple Component AV Cable
- Apple Dock Connector to USB Cable
- iPod Universal Dock Adapter 3-Pack

- 
1. Weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Song capacity is based on 4 minutes per song and 128-Kbps AAC encoding; in 256-Kbps AAC format, song capacity is up to 3,500 songs (32GB) or 7,000 songs (64GB); actual capacity varies by encoding method and bit rate.
  4. Photo capacity is based on iPod-viewable photos transferred from iTunes.
  5. Video capacity is based on H.264 1.5-Mbps video at 640-by-480 resolution combined with 128-Kbps audio; actual capacity varies by content.
  6. Internet access required; broadband recommended; fees may apply.
  7. For iPod touch with Maps, the Maps application provides your approximate location using information based on your proximity to known Wi-Fi networks (when on and available). The more accurate the available information, the smaller the circle identifying your position on the map. The feature is not available in all areas. Known Wi-Fi networks are predominantly in urban areas. In order to provide your location, data is collected in a form that does not personally identify you. If you do not want such data collected, do not enable the feature. Not enabling the feature will not impact the functionality of your iPod touch.
  8. Testing conducted by Apple in August 2009 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (128-Kbps AAC); video content was purchased from the iTunes Store. iPod units were associated to a Wi-Fi network and Auto-Brightness was turned off; all other settings were default. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  9. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Apr 6, 2016

# iPod classic 160GB (Late 2009) - Technical Specifications

## Size and weight

Height:  
4.1 inches (103.5 mm)  
Width:  
2.4 inches (61.8 mm)  
Depth:  
0.41 inch (10.5 mm)  
Weight:  
4.9 ounces (140 grams)<sup>1</sup>

## Capacity

- 160GB hard drive<sup>2</sup>
- Holds up to 40,000 songs in 128-Kbps AAC format<sup>3</sup>
- Holds up to 25,000 iPod-viewable photos<sup>4</sup>
- Holds up to 200 hours of video<sup>5</sup>
- Stores data via USB hard drive

## In the box

- iPod classic
- Earphones
- USB 2.0 cable
- Dock adapter
- Quick Start guide

## Environmental Status Report

iPod classic embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- BFR-free
- Mercury-free LED-backlit display
- PVC-free
- Highly recyclable aluminum and stainless steel enclosure

## Display

- 2.5-inch (diagonal) color LCD with LED backlight
- 320-by-240-pixel resolution at 163 pixels per inch

## Audio

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## Headphones

- Earphones
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Video

- H.264 video, up to 1.5 Mbps, 640 by 480 pixels, 30 frames per second, Low-Complexity version of the H.264 Baseline Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; H.264 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Baseline Profile up to Level 3.0 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4,

# 572\_iPod classic 160GB (Late 2009) - Technical Specifications.pdf

and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

## Languages

- Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, and Turkish
- Additional language support for display of song, album, and artist information: Bulgarian, Croatian, Romanian, Serbian, Slovak, Slovenian, Ukrainian, and Vietnamese

## Input and output

- Dock connector
- 3.5-mm stereo headphone jack

## External buttons and controls

- Hold switch
- Click Wheel

## Battery and power<sup>6</sup>

- Built-in rechargeable lithium-ion battery
- Playback time
  - Music playback time: Up to 36 hours when fully charged
  - Video playback time: Up to 6 hours when fully charged
- Charging via USB to computer system or power adapter (sold separately)
  - Fast-charge time: about 2 hours (charges up to 80% of battery capacity)
  - Full-charge time: about 4 hours

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.4.11 or later
- iTunes 9 or later<sup>7</sup>

## Windows system requirements

- PC with USB 2.0 port
- Windows Vista or Windows XP Home or Professional with Service Pack 3 or later
- iTunes 9 or later<sup>7</sup>

## Environmental requirements

- Operating temperature: 32° to 95° F  
(0° to 35° C)
- Nonoperating temperature: -4° to 113° F  
(-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet  
(3000 m)

## Accessories

### In-Ear Headphones with Remote and Mic

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing.

### USB Power Adapter

Use this ultracompact USB-based adapter to charge your iPhone or iPod whenever it's not connected to a computer.

### Earphones with Remote and Mic

These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.



# 572\_iPod classic 160GB (Late 2009) - Technical Specifications.pdf

## Universal Dock with Remote

Get easy access to a USB port for charging and syncing your iPod or for connecting to a TV or speakers.

Apple Composite AV Cable

Apple Component AV Cable

Apple Dock Connector to USB Cable

iPod Universal Dock Adapter 3-Pack

- 
1. Weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Song capacity is based on 4 minutes per song and 128-Kbps AAC encoding; in 256-Kbps AAC format, song capacity is up to 20,000 songs; actual capacity varies by encoding method and bit rate.
  4. Photo capacity is based on iPod-viewable photos transferred from iTunes.
  5. Video capacity is based on H.264 1.5-Mbps video at 640-by-480 resolution combined with 128-Kbps audio; actual capacity varies by content.
  6. Testing conducted by Apple in August 2009 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (128-Kbps AAC). Video content was purchased from the iTunes Store. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  7. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Jul 18, 2011

# iTunes 9.2 for Mac - Technical Specifications

## What's new in iTunes 9.2

iTunes 9.2 comes with several new features and improvements, including:

- Sync with iPhone 4 to enjoy your favorite music, movies, TV shows, books and more on-the-go
- Sync and read books with iPhone or iPod touch with iOS 4 and iBooks 1.1
- Organize and sync PDF documents as books. Read PDFs with iBooks 1.1 on iPad and any iPhone or iPod touch with iOS 4
- Organize your apps on your iOS 4 home screens into folders using iTunes
- Faster back-ups while syncing an iPhone or iPod touch with iOS 4
- Performance improvements make scrolling much faster

## Macintosh Hardware

- Mac computer with an Intel, PowerPC G5 or G4 processor
- Intel, PowerPC G5 or 1.0GHz PowerPC G4 or faster processor is required to play Standard Definition video from the iTunes Store
- 2.0GHz Intel Core 2 Duo or faster processor is required to play HD video, an iTunes LP, or iTunes Extras from the iTunes Store
- 512MB of RAM; 1GB is required to play HD video, an iTunes LP, or iTunes Extras
- Screen resolution of 1024x768 or greater; 1280x800 or greater is required to play an iTunes LP or iTunes Extras
- Playing videos also requires at least 16MB of video RAM
- Broadband Internet connection to use the iTunes Store
- Apple combo drive or SuperDrive to create audio, MP3, or back-up CDs; some non-Apple CD-RW recorders may also work.
- Apple SuperDrive to back up your library to DVDs; some non-Apple DVD-RW drives may also work.

## Macintosh Software

- Mac OS X version 10.4.11 or later; Mac OS X version 10.5 or later is required to play an iTunes LP or iTunes Extras
- QuickTime 7.6 or later
- Support for HE-AAC requires QuickTime 7.6.4 and Mac OS X version 10.5 or later
- Safari 4.0.3 or later
- 200MB of available disk space

Published Date: Sep 1, 2010

# iTunes 9.2 for Windows - Technical Specifications

## What's new in iTunes 9.2

iTunes 9.2 comes with several new features and improvements, including:

- Sync with iPhone 4 to enjoy your favorite music, movies, TV shows, books and more on-the-go
- Sync and read books with iPhone or iPod touch with iOS 4 and iBooks 1.1
- Organize and sync PDF documents as books. Read PDFs with iBooks 1.1 on iPad and any iPhone or iPod touch with iOS 4
- Organize your apps on your iOS 4 home screens into folders using iTunes
- Faster back-ups while syncing an iPhone or iPod touch with iOS 4
- Performance improvements make scrolling much faster

## Windows Requirements

### Windows Hardware

- A PC with a 1GHz Intel or AMD processor
- Intel Pentium D or faster processor is required to play Standard Definition video from the iTunes Store
- 2.0GHz Intel Core 2 Duo or faster processor is required to play HD video, an iTunes LP, or iTunes Extras from the iTunes Store
- 512MB of RAM; 1GB is required to play HD video, an iTunes LP, or iTunes Extras
- Screen resolution of 1024x768 or greater; 1280x800 or greater is required to play an iTunes LP or iTunes Extras
- DirectX 9.0-compatible video card with 32MB of video RAM; 64MB recommended
- QuickTime-compatible audio card
- Broadband Internet connection to use the iTunes Store
- iTunes-compatible CD or DVD recorder to create audio CDs, MP3 CDs, or back-up CDs or DVDs

### Windows Software

- Windows XP Service Pack 2 or later, 32-bit editions of Windows Vista, or 32-bit editions of Windows 7
- 64-bit editions of Windows Vista or Windows 7 require the iTunes 64-bit installer
- QuickTime 7.6.6 or later is required (included)
- 200MB of available disk space
- Screen reader support requires Window-Eyes 7.1.1 or later; for information about accessibility in iTunes, visit [www.apple.com/accessibility](http://www.apple.com/accessibility)

Published Date: Aug 31, 2010

# Mac OS X v10.6 Snow Leopard - Technical Specifications

## General requirements

- Mac computer with an Intel processor
- 1GB of memory
- 5GB of available disk space
- DVD drive for installation
- Some features require a compatible Internet service provider; fees may apply.

## Feature-specific requirements

### Time Machine

requires an additional hard drive or Time Capsule (sold separately).

### Photo Booth

requires an iSight camera (built in or external), USB video class (UVC) camera, or FireWire DV camcorder. Backdrop effects when using a DV camcorder require fixed focus, exposure, and white balance.

### Boot Camp

requires Windows XP with Service Pack 2 or Windows Vista (sold separately).

### Screen sharing

in iChat and the Finder requires a 128-Kbps Internet connection (300 Kbps recommended).

### DVD Player

requires a 1.6GHz processor or faster for improved deinterlacing.

### iChat

- Audio chats require a microphone and a 56-Kbps Internet connection.
- Video chats require an iSight camera (built in or external), USB video class (UVC) camera, or FireWire DV camcorder; and a 128-Kbps upstream and downstream Internet connection.
- Backdrop effects when using a DV camcorder require fixed focus, exposure, and white balance.
- Some iChat features offer better performance and quality with higher system capabilities. [More details](#)

### Exchange Support

requires Microsoft Exchange Server 2007 Service Pack 1 Update Rollup 4. Auto-setup requires enabling the Autodiscovery feature of Microsoft Exchange Server.

### QuickTime X movie capture

requires iSight camera (built-in or external), USB video class (UVC) camera, or FireWire DV camcorder.

### QuickTime H.264 hardware acceleration

requires a Mac with an NVIDIA 9400M graphics processor.

### Developer tools

require 1GB of memory and an additional 3GB of available disk space.

### OpenCL

requires one of the following graphics cards or graphics processors:

- NVIDIA GeForce 9400M, GeForce 9600M GT, GeForce 8600M GT, GeForce GT 120, GeForce GT 130, GeForce GTX 285, GeForce 8800 GT, GeForce 8800 GS, Quadro FX 4800, Quadro FX5600

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- ATI Radeon 4850, Radeon 4870

## 64-bit support

requires a Mac with a 64-bit processor.

## Grand Central Dispatch

requires a Mac with a multicore processor.

## What's in the Box

- Installation DVD
- Printed and electronic documentation

## Applications

- Address Book
- Automator
- Calculator
- Chess
- Dashboard
- Dictionary
- DVD Player
- Font Book
- Front Row
- iCal
- iChat
- Image Capture
- iSync (supported devices)
- iTunes
- Mail
- Photo Booth
- Preview
- QuickTime Player
- Safari
- Stickies
- System Preferences
- TextEdit
- Time Machine

## Utilities

- Activity Monitor
- AirPort Utility
- Audio MIDI Setup
- Bluetooth File Exchange
- Boot Camp Assistant
- ColorSync Utility
- Console
- DigitalColor Meter
- Disk Utility
- Exposé
- Grab
- Grapher
- Java Preferences
- Keychain Access
- Migration Assistant
- Network Utility
- Podcast Capture
- RAID Utility
- Script Editor
- Script Utility
- Setup Assistant
- Spaces

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- System Profiler
- Terminal
- VoiceOver Utility
- X11

## Key Technologies

- AppleScript
- Aqua
- Bonjour
- CDSA security architecture
- Cocoa, Carbon, and Java
- ColorSync
- Core Animation
- Core Audio
- Core Image
- Core Video
- Grand Central Dispatch
- H.264
- Inkwell
- OpenCL
- OpenGL
- PDF
- Quartz Extreme
- QuickTime X
- 64-bit computing
- Sync
- Unicode 5.1
- Universal Access
- UNIX
- USB and FireWire peripheral support
- Xgrid

## Development

- Xcode 3 IDE with Interface Builder 3
- Instruments
- Dashcode
- AppleScript Studio
- Automator 2
- Shark
- GCC compiler and toolset (original project by FSF.org)
- DTrace (original project by Sun)
- Complete Java JDK, including javac, javadoc, ANT, and Maven tools
- Apache web server
- AppleScript
- Ruby and the Ruby on Rails frameworks
- Python
- Perl
- PHP
- SQLite

## Languages

- English
- Japanese
- French
- German
- Spanish
- Italian
- Dutch
- Swedish
- Danish
- Norwegian
- Finnish

# 575\_Mac OS X v10.6 Snow Leopard - Technical Specifications.pdf

- Traditional Chinese
- Simplified Chinese
- Korean
- Brazilian Portuguese
- Portuguese (Portugal)
- Russian
- Polish

Published Date: Jul 1, 2012

# iMac (21.5-inch, Late 2009) - Technical Specifications

## Processor and memory

- 3.06GHz Intel Core 2 Duo processor with 3MB shared L2 cache
- 3.33GHz Intel Core 2 Duo processor with 6MB shared L2 cache

4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; four SO-DIMM slots support up to 16GB

## Size and weight

- Height: 17.75 inches (45.1 cm)
- Width: 20.8 inches (52.8 cm)
- Depth: 7.42 inches (18.85 cm)
- Weight: 20.5 pounds (9.3 kg)<sup>1</sup>

## Connections and expansion

- One FireWire 800 port; 7 watts
- Four USB 2.0 ports
- SD card slot

## Communications

- Built-in AirPort Extreme 802.11n Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Two internal 17-watt high-efficiency amplifiers
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone
- Support for Apple Stereo Headset with microphone

## Environmental Status Report

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR 5.0 requirements
- Rated EPEAT Gold

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB	Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)
Idle	3.0	16
Hard drive accessing	3.0	17
CD drive accessing	no value	no value

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

- Built-in 21.5-inch (viewable) LED-backlit glossy widescreen TFT active-matrix liquid crystal display with IPS technology



# 576\_iMac (21.5-inch, Late 2009) - Technical Specifications.pdf

- Resolution: 1920 by 1080 pixels
- 16:9 aspect ratio
- Millions of colors at all resolutions
- Typical viewing angle: 178° horizontal; 178° vertical
- Typical brightness: 320 cd/m<sup>2</sup>

## Graphics and video support

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>
- ATI Radeon HD 4670 graphics processor with 256MB of GDDR3 memory
- Built-in iSight camera
- Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI (adapters sold separately).
- Support for extended desktop and video mirroring modes
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display

## Software

- Mac OS X v10.6 Snow Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## Storage<sup>4</sup>

- 500GB 7200-rpm Serial ATA hard drive
- 1TB 7200-rpm Serial ATA hard drive
- *Optional 2TB 7200-rpm Serial ATA hard drive*

## Optical drive

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
  - Writes DVD+R DL and DVD-R DL discs at up to 4x speed
  - Writes DVD-R and DVD+R discs at up to 8x speed
  - Writes DVD-RW discs at up to 6x speed and DVD+RW discs at up to 8x speed
  - Reads DVDs at up to 8x speed
  - Writes CD-R discs at up to 24x speed
  - Writes CD-RW discs at up to 16x speed
  - Reads CDs at up to 24x speed

## Electrical and operating requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 241W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -4° to 116° F (-20° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- Typical acoustical performance
  - Sound pressure level (operator position): 18 dBA at idle<sup>6</sup>

## What's included

### In the box:

- iMac
- Apple Wireless Keyboard
- Magic Mouse
- Cleaning cloth
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

### Included software:

### Mac OS X Snow Leopard

Includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools, and more.

# 576\_iMac (21.5-inch, Late 2009) - Technical Specifications.pdf

## **iLife**

Includes iPhoto, iMovie, GarageBand, and iWeb.

## **Accessories**

### **Mac Software**

- iWork '09
- Aperture
- Logic Express
- Final Cut Express

### **Displays and Graphics**

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### **AirPort & Wireless**

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station

### **Other Accessories**

- VESA Mount Adapter Kit
- AppleCare Protection Plan

- 
1. Weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  5. PVC-free external cables in North America only.
  6. Acoustics measured on standard 21.5-inch iMac systems with 3.06GHz Intel Core 2 Duo processors. Acoustics may vary by configuration.

Published Date: Dec 17, 2013

# Mac mini (Late 2009) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

- Height:  
2 inches (5.08 cm)
- Width:  
6.5 inches (16.51 cm)
- Depth:  
6.5 inches (16.51 cm)
- Weight:  
2.9 pounds (1.31 kg)<sup>1</sup>

## Processor and memory

- 2.26GHz, 2.53GHz, or 2.66GHz Intel Core 2 Duo processor
- 3MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) or 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 4GB

## In the box

- Mac mini
- Mini-DVI to DVI Adapter
- 110W power adapter and power cord
- Install/restore DVDs
- Printed and electronic documentation

## Environmental Status Report

Mac mini is designed with the following features to reduce its environmental impact:

- BFR-free
- PVC-free<sup>2</sup>
- Highly recyclable aluminum and polycarbonate enclosure
- Meets ENERGY STAR requirements
- Rated EPEAT Gold

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	2.26 GHz	2.53 GHz	2.26 GHz	2.53 GHz
Idle	2.8	3.0	10	13
Hard drive accessing	2.7	3.1	10	13
CD drive accessing	3.4	3.5	20	21

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Peripheral connections

- One FireWire 800 port (up to 800 Mbps)
- Five USB 2.0 ports (up to 480 Mbps)

# 577\_Mac mini (Late 2009) - Technical Specifications.pdf

## Graphics and video support

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>
- Extended desktop and video mirroring: Simultaneously supports up to 1920 by 1200 pixels on a DVI or VGA display; up to 2560 by 1600 pixels on a dual-link DVI display using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- Mini-DVI port
- DVI output using Mini-DVI to DVI Adapter (included)
- VGA output using Mini-DVI to VGA Adapter (sold separately)
- Mini DisplayPort output

## Communications

- Built-in AirPort Extreme 802.11n Wi-Fi wireless networking<sup>4</sup>; IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)
- Built-in speaker

## Storage

- 160GB, 320GB, or 500GB Serial ATA hard disk drive<sup>5</sup>
- Slot-loading SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW): Writes DVD+R DL and DVD-R DL discs at up to 6x speed, writes DVD-R and DVD+R discs at up to 8x speed, writes DVD-RW discs at up to 6x speed, writes DVD+RW discs at up to 8x speed, reads DVDs at up to 8x speed, writes CD-R and CD-RW discs at up to 24x speed, reads CDs at up to 24x speed

## Electrical and operating requirements

- Line voltage: 100-120V AC (applies to U.S., Japan, and South America only)
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 110W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Included software

- Mac OS X v10.6 Snow Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

You can also have the following software preinstalled, only at the Apple Online Store:

- iWork '09
- Final Cut Express
- Aperture
- Logic Express
- FileMaker

## Configurations

	2.26GHz Mac mini	2.53GHz Mac mini
<b>Processor</b>	2.26GHz Intel Core 2 Duo	2.53GHz Intel Core 2 Duo
<b>L2 cache</b>	3MB shared	
<b>System bus</b>	1066MHz	
<b>Memory</b>	2GB of 1066MHz DDR3 SDRAM; supports up to 4GB	4GB of 1066MHz DDR3 SDRAM; supports up to 4GB
<b>Hard drive</b>	160GB Serial ATA <sup>5</sup> ; 5400 rpm	320GB Serial ATA <sup>5</sup> ; 5400 rpm

# 577\_Mac mini (Late 2009) - Technical Specifications.pdf

	2.26GHz Mac mini	2.53GHz Mac mini
<b>Optical drive</b>	Slot-loading 8x SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)	
<b>Graphics</b>	NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>	
<b>Ports</b>	One FireWire 800 port (8 watts); five USB 2.0 ports (up to 480 Mbps); mini-DVI output; VGA output (using optional adapter); Mini DisplayPort	
<b>Audio</b>	Built-in speaker, combined optical digital audio input/audio line in, combined optical digital audio output/headphone out	
<b>Ethernet</b>	Built-in 10/100/1000BASE-T (Gigabit)	
<b>Wireless</b>	Built-in AirPort Extreme 802.11n Wi-Fi <sup>4</sup> ; built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)	
<b>Limited warranty and service</b>	Your Mac mini comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	

## Options

### Configure to Order

- 2.53GHz Intel Core 2 Duo
- 2.66GHz Intel Core 2 Duo
- 320GB 5400-rpm hard drive
- 500GB 5400-rpm hard drive
- Up to 4GB of 1066MHz DDR3 SDRAM
- Apple LED Cinema Display
- Apple Wireless Keyboard
- Apple Keyboard
- Apple Keyboard with Numeric Keypad
- Magic Mouse
- Apple Mouse
- Apple Remote
- iWork '09
- Aperture
- Final Cut Express
- Logic Express

### Accessories

- 110W Mac mini Power Adapter
- AirPort Express Base Station
- AirPort Extreme Base Station
- Apple Mini-DVI to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. PVC-free external cables in North America only.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  5. 1GB = 1 billion bytes; actual formatted capacity less.

Published Date: Apr 6, 2016

# Mac mini (Mac OS X Server, Late 2009) - Technical Specifications

## Size and weight

Height:  
2 inches (5.08 cm)  
Width:  
6.5 inches (16.51 cm)  
Depth:  
6.5 inches (16.51 cm)  
Weight:  
2.9 pounds (1.31 kg)<sup>1</sup>

## Processor and memory

- 2.53GHz Intel Core 2 Duo processor
- 3MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM

## Environmental Status Report

Mac mini is designed with the following features to reduce its environmental impact:

- BFR-free
- PVC-free<sup>2</sup>
- Highly recyclable aluminum and polycarbonate enclosure
- Meets ENERGY STAR requirements
- Rated EPEAT Gold

## Peripheral connections

- One FireWire 800 port (up to 800 Mbps)
- Five USB 2.0 ports (up to 480 Mbps)

## Graphics and video support

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>
- Extended desktop and video mirroring: Simultaneously supports up to 1920 by 1200 pixels on a DVI or VGA display; up to 2560 by 1600 pixels on a dual-link DVI display using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- Mini-DVI port
- DVI output using Mini-DVI to DVI Adapter (included)
- VGA output using Mini-DVI to VGA Adapter (sold separately)
- Mini DisplayPort output

## Communications

- Built-in AirPort Extreme 802.11n Wi-Fi wireless networking<sup>4</sup>; IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)
- Built-in speaker

## Storage

- Dual 500GB 5400-rpm Serial ATA hard disk drives<sup>4</sup>

## Electrical and operating requirements

- Line voltage: 100-120V AC  
(applies to U.S., Japan, and South America only)
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 110W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## In the box

- Mac mini
- Mini-DVI to DVI Adapter
- 110W power adapter and power cord
- Install/restore DVDs
- Printed and electronic documentation

## Software

- Mac OS X Server v10.6 Snow Leopard

- 
1. Actual weight varies by configuration and manufacturing process.
  2. PVC-free external cables in North America only.
  3. Memory available to Mac OS X Server may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  5. 1GB = 1 billion bytes; actual formatted capacity less.

Published Date: Oct 21, 2009

# MacBook (13-inch, Late 2009) - Technical Specifications

## Size and weight

Height:  
1.08 inches (2.74 cm)  
Width:  
13.00 inches (33.03 cm)  
Depth:  
9.12 inches (23.17 cm)  
Weight:  
4.7 pounds (2.13 kg)<sup>1</sup>

## Processor and memory

- 2.26GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache running 1:1 with processor speed
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 4GB

## Communications

Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible  
Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)  
Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Environmental Status Report

MacBook is designed with the following features to reduce its environmental impact:

- BFR-free
- PVC-free system
- Mercury-free
- Arsenic-free display
- Recyclable polycarbonate enclosure
- 20% smaller packaging
- Meets ENERGY STAR Version 5.0 requirements
- Rated EPEAT Gold

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB	Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)
Idle	2.6	13
Hard drive accessing	2.6	14
CD drive accessing	3.3	28

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors

**Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 768, 1024 by 640, 800 by 600, 800 by 500, 720 by 480, and 640 by 480 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio



# 579\_MacBook (13-inch, Late 2009) - Technical Specifications.pdf

## Graphics and video support

NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>

Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors

Built-in iSight camera

Mini DisplayPort

## Video output options

**DVI output** using Mini DisplayPort to DVI Adapter

**VGA output** using Mini DisplayPort to VGA Adapter

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports two-finger scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone
- Combined optical digital output/headphone out (user-selectable analog audio line in)
- Supports Apple Stereo Headset with microphone

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- Mini DisplayPort
- Two USB 2.0 ports (up to 480 Mbps)
- Audio in/out
- Kensington lock slot

## Storage

- 250GB 5400-rpm Serial ATA hard disk drive; optional 320GB or 500GB 5400-rpm drive<sup>4</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)

Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW

Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, and DVD+RW; 24x CD

## Battery and power<sup>5</sup>

Built-in 60-watt-hour lithium-polymer battery

60W MagSafe Power Adapter with cable management system

MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)

# 579\_MacBook (13-inch, Late 2009) - Technical Specifications.pdf

- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Installed software

- Mac OS X v10.6 Snow Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, GarageBand, iWeb, iDVD)

## What's in the box

- MacBook
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Install/restore DVDs
- Printed and electronic documentation

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 1TB or 2TB Serial ATA server-grade hard disk drive
- 802.11n Wi-Fi
- USB port for connecting a printer or external hard drive

### Configure to order

- 320GB (5400-rpm) hard drive
- 500GB (5400-rpm) hard drive
- Up to 4GB of 1066MHz DDR3 SDRAM
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan
- Aperture
- Final Cut Express
- Logic Express
- iWork '09

### Accessories

- Apple LED Cinema Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Apple Magic Mouse
- Apple Keyboard

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. 1GB = 1 billion bytes; actual formatted capacity less.
  5. Testing conducted by Apple in October 2009 using preproduction 2.26GHz Intel Core 2 Duo-based MacBook units. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

# Apple Studio Display 17 (ADC) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Apple Studio Display 17 (ADC) - Technical Specifications

Configurations	Apple Studio Display 17 Inch ADC
Model	M7770
Screen Size (diagonal viewable image size)	17 inches (16.15 diagonal viewable)
Screen type	CRT, Natural Flat Diamondtron
Resolutions	<ul style="list-style-type: none"><li>1600 x 1200 (65 Hz) (native resolution)</li><li>1280 x 1024 (75 Hz)</li><li>1056 x 792 (96 Hz)</li><li>1024 x 768 (99 Hz)</li><li>832 x 624 (120 Hz)</li><li>800 x 600 (125 Hz)</li><li>640 x 480 (153 Hz)</li></ul>
Display colors (maximum)	16.7 million
Vertical refresh	60-160 Hz
Horizontal Scan	80 kHz
Aperture gille pitch	0.25 mm
User controls (hardware and software)	Power, Control Panel Launcher
Display connector	ADC
Serial (USB or ADB) connectors:	2 USB 1.1 ports (on right side of display)
System requirements	Power Mac G4 with ADC port
Power	<ul style="list-style-type: none"><li>Maximum: 113W</li><li>Energy Saver Mode: 35W</li></ul>

Published Date: Apr 6, 2016

# iPad - Technical Specifications

## Size and weight<sup>1</sup>

Height:

9.56 inches (242.8 mm)

Width:

7.47 inches (189.7 mm)

Depth:

0.5 inch (13.4 mm)

Weight:

1.5 pounds (0.68 kg) Wi-Fi model;

1.6 pounds (0.73 kg) Wi-Fi + 3G model

## Display

- 9.7-inch (diagonal) LED-backlit glossy widescreen Multi-Touch display with IPS technology
- 1024-by-768-pixel resolution at 132 pixels per inch (ppi)
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously

## Wireless and cellular

### Wi-Fi model

- Wi-Fi (802.11a/b/g/n)
- Bluetooth 2.1 + EDR technology

### Wi-Fi + 3G model

- UMTS/HSDPA (850, 1900, 2100 MHz)
- GSM/EDGE (850, 900, 1800, 1900 MHz)
- Data only<sup>2</sup>
- Wi-Fi (802.11a/b/g/n)
- Bluetooth 2.1 + EDR technology

## Location

- Wi-Fi
- Digital compass
- Assisted GPS (Wi-Fi + 3G model)
- Cellular (Wi-Fi + 3G model)

## In the box

- iPad
- Dock Connector to USB Cable
- 10W USB Power Adapter
- Documentation

## Environmental Status Report

iPad embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- BFR-free
- Mercury-free LCD display
- PVC-free
- Recyclable aluminum and glass enclosure

## Capacity<sup>3</sup>

- 16GB, 32GB, or 64GB flash drive

# 580\_iPad - Technical Specifications.pdf

## Processor

- 1GHz Apple A4 custom-designed, high-performance, low-power system-on-a-chip

## Sensors

- Accelerometer
- Ambient light sensor

## Audio playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: HE-AAC (V1), AAC (16 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and video

- Support for 1024 by 768 pixels with Dock Connector to VGA Adapter; 576p and 480p with Apple Component AV Cable; 576i and 480i with Apple Composite AV Cable
- H.264 video up to 720p, 30 frames per second, Main Profile level 3.1 with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail attachment support

- Viewable document types: .jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel)

## Languages

- Language support for English (U.S.), English (UK), French (France), German, Traditional Chinese, Simplified Chinese, Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese, Russian, Polish, Turkish, Ukrainian, Hungarian, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, Croatian, Catalan, and Vietnamese
- Keyboard support for English (U.S.), English (UK), French (France), French (Canadian), French (Switzerland), German, Traditional Chinese (Handwriting, Pinyin, Zhuyin, Cangjie, Wubihua), Simplified Chinese (Handwriting, Pinyin, Wubihua), Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese (Romaji, Fifty Key), Japanese (Kana), Russian, Polish, Turkish, Ukrainian, Estonian, Hungarian, Icelandic, Lithuanian, Latvian, Flemish, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, Croatian, Bulgarian, Serbian (Cyrillic/Latin), Catalan, Vietnamese, Tibetan, Macedonian, and Cherokee
- Dictionary support (enables predictive text and autocorrect) for English (U.S.), English (UK), French, German, Traditional Chinese, Simplified Chinese, Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese (Romaji), Japanese (Kana), Russian, Polish, Turkish, Ukrainian, Hungarian, Lithuanian, Flemish, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malaysian, Romanian, Slovak, Croatian, Catalan, Vietnamese, and Cherokee

## Accessibility

- Support for playback of closed-captioned content
- VoiceOver screen reader
- Full-screen zoom magnification
- White on black display
- Mono audio

## Battery and power<sup>4</sup>

- Built-in 25-watt-hour rechargeable lithium-polymer battery
- Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
- Up to 9 hours of surfing the web using 3G data network
- Charging via power adapter or USB to computer system

## Input and output

- Dock connector port

# 580\_iPad - Technical Specifications.pdf

- 3.5-mm stereo headphone jack
- Built-in speaker
- Microphone
- Micro-SIM card tray (Wi-Fi + 3G model only)

## External buttons and controls

- On/Off, Sleep/wake
- Mute
- Volume up/down
- Home

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.5.8 or later
- iTunes 9.1 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))
- iTunes Store account
- Internet access

## Windows system requirements

- PC with USB 2.0 port
- Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
- iTunes 9.1 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))
- iTunes Store account
- Internet access

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing

## iPad Accessories

### iPad Keyboard Dock

The iPad Keyboard Dock combines a dock for charging your iPad with a full-size keyboard. The dock has a rear dock connector port, which lets you connect to an electrical outlet using the USB Power Adapter, sync to your computer, and use accessories like the iPad Camera Connection Kit. An audio line out port lets you connect to a stereo or powered speakers (audio cable sold separately). [Buy now](#)

### iPad Case

With a soft microfiber interior and reinforced panels to provide structure, the iPad Case is the perfect way to carry around your iPad. And it does double duty. It folds in just the right places to act as a stand that holds iPad at an ideal angle for watching videos and slideshows or for typing on the onscreen keyboard. [Buy now](#)

### iPad Dock

With the iPad Dock, you get easy access to a dock connector port for syncing or charging, and an audio line out port for connecting to powered speakers via an optional audio cable. The iPad Dock also supports other iPad accessories, such as the iPad Dock Connector to VGA Adapter and the iPad Camera Connection Kit. [Buy now](#)

### iPad Camera Connection Kit

The iPad Camera Connection Kit gives you two ways to import photos and videos from a digital camera: using your camera's USB cable or directly from an SD card. iPad supports standard photo formats, including JPEG and RAW. [Buy now](#)

### iPad 10W USB Power Adapter

The iPad 10W USB Power Adapter lets you charge your iPad directly through an electrical outlet. And the 6-foot-long power cord allows you to charge it from an even greater distance. [Buy now](#)

- 
1. Actual size and weight vary by configuration and manufacturing process.
  2. 3G data plan sold separately.
  3. 1GB = 1 billion bytes; actual formatted capacity less.
  4. Testing conducted by Apple in March 2010 using preproduction iPad units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or 3G. Video content was a

## 580\_iPad - Technical Specifications.pdf

repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique songs, consisting of a combination of songs imported from CDs using iTunes (128-Kbps AAC encoding) and songs purchased from the iTunes Store (256-Kbps AAC encoding). Internet over Wi-Fi and 3G tests were conducted using a closed network (for Wi-Fi only) and dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over 3G); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.

Published Date: Oct 5, 2016

# MacBook Pro (17-inch, Mid 2010) - Technical Specifications

## Size and weight

- Height:  
0.98 inch (2.50 cm)
- Width:  
15.47 inches (39.3 cm)
- Depth:  
10.51 inches (26.7 cm)
- Weight:  
6.6 pounds (2.99 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- One FireWire 800 port (up to 800 Mbps)
- Three USB 2.0 ports (up to 480 Mbps)
- Mini DisplayPort
- Audio line in
- Audio line out
- ExpressCard/34 slot
- Kensington lock slot

## Communications

- AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Stereo speakers with subwoofers
- Omnidirectional microphone (located under left speaker grille)
- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- Support for Apple iPhone headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Reduced packaging volume
- Meets ENERGY STAR Version 5.0 requirements
- Rated EPEAT Gold<sup>4</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB	Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)
Idle	2.8	15
Hard drive accessing	2.8	15



# 581\_MacBook Pro (17-inch, Mid 2010) - Technical Specifications.pdf

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
CD drive accessing	3.4	29

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

- 17-inch (diagonal) high-resolution LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1920 by 1200 (native), 1680 by 1050, 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio stretched; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

- NVIDIA GeForce GT 330M graphics processor with 512MB of GDDR3 memory
- Intel HD Graphics with 256MB of DDR3 SDRAM shared with main memory<sup>5</sup>
- Automatic graphics switching
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- iSight camera
- Mini DisplayPort

## Pure digital video output

**DVI output** using Mini DisplayPort to DVI Adapter (optional)

**VGA output** using Mini DisplayPort to VGA Adapter (optional)

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)

**HDMI output** using a third-party Mini DisplayPort to HDMI Adapter

## Input

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.53GHz Intel Core i5 processor with 3MB shared L3 cache; or optional 2.66GHz Intel Core i7 processor with 4MB shared L3 cache
- 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 memory; two SO-DIMM slots support up to 8GB

## Storage

- 500GB 5400-rpm Serial ATA hard drive; optional 500GB 7200-rpm hard drive, or 128GB, 256GB, or 512GB solid-state drive<sup>6</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>7</sup>

- Built-in 95-watt-hour lithium-polymer battery
- 85W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

# 581\_MacBook Pro (17-inch, Mid 2010) - Technical Specifications.pdf

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

- MacBook Pro
- Display cleaning cloth
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Software DVDs
- Printed and electronic documentation

## Software

- Mac OS X v10.6 Snow Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## 17-inch Configuration

	<b>2.53GHz MacBook Pro (MC024LL/A)</b>
<b>Enclosure</b>	Precision aluminum unibody
<b>Processor</b>	2.53GHz Intel Core i5
<b>L3 cache</b>	3MB shared
<b>Memory</b>	4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 8GB
<b>Hard drive<sup>6</sup></b>	500GB Serial ATA; 5400 rpm
<b>Slot-loading optical drive</b>	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
<b>Graphics</b>	Intel HD Graphics <sup>5</sup> and NVIDIA GeForce GT 330M with automatic graphics switching
<b>Graphics memory</b>	512MB GDDR3
<b>Video</b>	iSight camera; Mini DisplayPort output port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)
<b>Display</b>	17-inch (diagonal) high-resolution LED-backlit glossy widescreen display, 1920-by-1200 resolution
<b>Expansion</b>	One FireWire 800 port (up to 800 Mbps), three USB 2.0 ports (up to 480 Mbps), ExpressCard/34 slot
<b>Audio</b>	Stereo speakers with subwoofers, omnidirectional microphone, audio line in minijack (digital/analog), audio line out/headphone minijack (digital/analog)
<b>Networking</b>	10/100/1000BASE-T (Gigabit) Ethernet
<b>Wireless</b>	AirPort Extreme Wi-Fi (based on IEEE 802.11n specification) <sup>2</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
<b>Hardware accessories</b>	85W MagSafe Power Adapter, AC wall plug, power cord
<b>Limited warranty and service</b>	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.
<b>Apple and the global environment</b>	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.
<b>Recycling</b>	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.

## Options

# 581\_MacBook Pro (17-inch, Mid 2010) - Technical Specifications.pdf

## Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 1TB or 2TB server-grade hard drive
- Wi-Fi Certified for 802.11n 2.0
- USB port for connecting a USB printer or USB external hard drive

## Configure to order

- 2.66GHz Intel Core i7 processor
- 500GB (7200-rpm) hard drive
- 128GB, 256GB, or 512GB solid-state drive
- Up to 8GB of 1066MHz DDR3 SDRAM
- Antiglare display
- Apple Remote
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan
- Aperture
- Final Cut Express
- Logic Express
- iWork

## Accessories

- Apple LED Cinema Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Magic Mouse
- Apple Keyboard with Numeric Keypad
- Apple Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. MacBook Pro achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.
  5. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  6. 1GB=1 billion bytes; actual formatted capacity less.
  7. Testing conducted by Apple in March 2010 using preproduction 2.53GHz Intel Core i5-based 17-inch MacBook Pro units. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processor document with display brightness set to the middle setting.

Published Date: Dec 1, 2010

# MacBook Pro (15-inch, Mid 2010) - Technical Specifications

## Size and weight

- Height:  
0.95 inch (2.41 cm)
- Width:  
14.35 inches (36.4 cm)
- Depth:  
9.82 inches (24.9 cm)
- Weight:  
5.6 pounds (2.54 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- One FireWire 800 port (up to 800 Mbps)
- Mini DisplayPort
- Two USB 2.0 ports (up to 480 Mbps)
- SD card slot
- Audio line in
- Audio line out
- Kensington lock slot

## Communications

- AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Stereo speakers with subwoofers
- Omnidirectional microphone (located under left speaker grille)
- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- Support for Apple iPhone headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Reduced packaging volume
- Meets ENERGY STAR Version 5.0 requirements
- Rated EPEAT Gold<sup>4</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB			Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)		
	2.4 GHz	2.53 GHz	2.66 GHz	2.4 GHz	2.53 GHz	2.66 GHz
Idle	2.9	2.8	2.8	18	16	18

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB			Sound Pressure Level Operator Position $L_{pAm}$ (dB)		
	2.4 GHz	2.53 GHz	2.66 GHz	2.4 GHz	2.53 GHz	2.66 GHz
<b>Hard drive accessing</b>	2.9	2.8	2.8	18	15	17
<b>CD drive accessing</b>	no value	3.4	3.4	no value	26	26

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

- 15.4-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched
- Optional 15.4-inch (diagonal) LED-backlit widescreen display with 1680 by 1050 pixels (glossy or antiglare)

## Graphics and video support

- NVIDIA GeForce GT 330M graphics processor with 256MB of GDDR3 memory on 2.4GHz and 2.53GHz configurations; or 512MB of GDDR3 memory on 2.66GHz configuration
- Intel HD Graphics with 256MB of DDR3 SDRAM shared with main memory<sup>5</sup>
- Automatic graphics switching
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- iSight camera
- Mini DisplayPort

## Pure digital video output

**DVI output** using Mini DisplayPort to DVI Adapter (optional)

**VGA output** using Mini DisplayPort to VGA Adapter (optional)

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)

**HDMI output** using a third-party Mini DisplayPort to HDMI Adapter

## Input

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.4GHz or 2.53GHz Intel Core i5 processor with 3MB shared L3 cache; or 2.66GHz Intel Core i7 processor with 4MB shared L3 cache
- 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 memory; two SO-DIMM slots support up to 8GB

## Storage

- 320GB or 500GB 5400-rpm Serial ATA hard drive; optional 500GB 7200-rpm hard drive, or 128GB, 256GB, or 512GB solid-state drive<sup>6</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>7</sup>

- Built-in 77.5-watt-hour lithium-polymer battery

# 582\_MacBook Pro (15-inch, Mid 2010) - Technical Specifications.pdf

- 85W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What’s in the box

- MacBook Pro
- Display cleaning cloth
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Software DVDs
- Printed and electronic documentation

## Software

- Mac OS X v10.6 Snow Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## 15-inch Configurations

	2.4GHz MacBook Pro (MC371LL/A)	2.53GHz MacBook Pro (MC372LL/A)	2.66GHz MacBook Pro (MC373LL/A)
Enclosure	Precision aluminum unibody		
Processor	2.4GHz Intel Core i5	2.53GHz Intel Core i5	2.66GHz Intel Core i7
L3 cache	3MB shared	3MB shared	4MB shared
Memory	4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 8GB		
Hard drive <sup>6</sup>	320GB Serial ATA; 5400 rpm	500GB Serial ATA; 5400 rpm	500GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)		
Graphics	Intel HD Graphics <sup>5</sup> and NVIDIA GeForce GT 330M with automatic graphics switching		
Graphics memory	256MB GDDR3	256MB GDDR3	512MB GDDR3
Video	iSight camera; Mini DisplayPort output port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)		
Display	15.4-inch (diagonal) LED-backlit glossy widescreen display, 1440-by-900 resolution		
Expansion	One FireWire 800 port (up to 800 Mbps), two USB 2.0 ports (up to 480 Mbps), SD card slot		
Audio	Stereo speakers with subwoofers, omnidirectional microphone, audio line in minijack (digital/analog), audio line out/headphone minijack (digital/analog)		
Networking	10/100/1000BASE-T (Gigabit) Ethernet		
Wireless	AirPort Extreme Wi-Fi (based on IEEE 802.11n specification) <sup>2</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology		
Hardware accessories	85W MagSafe Power Adapter, AC wall plug, power cord		
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer’s purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.		

# 582\_MacBook Pro (15-inch, Mid 2010) - Technical Specifications.pdf

	2.4GHz MacBook Pro (MC371LL/A)	2.53GHz MacBook Pro (MC372LL/A)	2.66GHz MacBook Pro (MC373LL/A)
<b>Apple and the global environment</b>	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.		
<b>Recycling</b>	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.		

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 1TB or 2TB server-grade hard drive
- Wi-Fi Certified for 802.11n 2.0
- USB port for connecting a USB printer or USB external hard drive

### Configure to order

- 500GB (5400-rpm) hard drive
- 500GB (7200-rpm) hard drive
- 128GB, 256GB, or 512GB solid-state drive
- Up to 8GB of 1066MHz DDR3 SDRAM
- 1680-by-1050 high-resolution glossy display
- 1680-by-1050 high-resolution antiglare display
- Apple Remote
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan
- Aperture
- Final Cut Express
- Logic Express
- iWork

### Accessories

- Apple LED Cinema Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Magic Mouse
- Apple Keyboard with Numeric Keypad
- Apple Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. MacBook Pro achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.
  5. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  6. 1GB=1 billion bytes; actual formatted capacity less.
  7. Testing conducted by Apple in March 2010 using preproduction 2.66GHz Intel Core i7-based MacBook Pro units. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processor document with display brightness set to the middle setting.

# MacBook Pro (13-inch, Mid 2010) - Technical Specifications

## Size and weight

- Height:  
0.95 inch (2.41 cm)
- Width:  
12.78 inches (32.5 cm)
- Depth:  
8.94 inches (22.7 cm)
- Weight:  
4.5 pounds (2.04 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- One FireWire 800 port (up to 800 Mbps)
- Mini DisplayPort
- Two USB 2.0 ports (up to 480 Mbps)
- SD card slot
- Audio in/out
- Kensington lock slot

## Communications

- AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Stereo speakers with subwoofers
- Omnidirectional microphone
- Combined headphone/line in (supports digital output)
- Support for Apple iPhone headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Reduced packaging volume
- Meets ENERGY STAR Version 5.0 requirements
- Rated EPEAT Gold<sup>4</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	2.4 GHz	2.66 GHz	2.4 GHz	2.66 GHz
Idle	2.8	2.8	17	17
Hard drive accessing	2.8	2.8	16	16
CD drive accessing	3.4	3.4	30	26



	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	2.4 GHz	2.66 GHz	2.4 GHz	2.66 GHz

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

- NVIDIA GeForce 320M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>5</sup>
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- iSight camera
- Mini DisplayPort

### Pure digital video output

**DVI output** using Mini DisplayPort to DVI Adapter (optional)

**VGA output** using Mini DisplayPort to VGA Adapter (optional)

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)

**HDMI output** using a third-party Mini DisplayPort to HDMI Adapter

## Input

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.4GHz or 2.66GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache
- 1066MHz frontside bus
- 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 memory; two SO-DIMM slots support up to 8GB

## Storage

- 250GB or 320GB 5400-rpm Serial ATA hard drive; optional 320GB or 500GB 5400-rpm hard drive, or 128GB, 256GB, or 512GB solid-state drive<sup>6</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>7</sup>

- Up to 10 hours wireless productivity
- Built-in 63.5-watt-hour lithium-polymer battery
- 60W MagSafe Power Adapter with cable management system
- MagSafe power port

# 583\_MacBook Pro (13-inch, Mid 2010) - Technical Specifications.pdf

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

- MacBook Pro
- Display cleaning cloth
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Software DVDs
- Printed and electronic documentation

## Software

- Mac OS X v10.6 Snow Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## 13-inch Configurations

	2.4GHz MacBook Pro (MC374LL/A)	2.66GHz MacBook Pro (MC375LL/A)
Enclosure	Precision aluminum unibody	
Processor	2.4GHz Intel Core 2 Duo	2.66GHz Intel Core 2 Duo
L2 cache	3MB shared	
System bus	1066MHz	
Memory	4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; supports up to 8GB	
Hard drive <sup>6</sup>	250GB Serial ATA; 5400 rpm	320GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
Graphics	NVIDIA GeForce 320M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>5</sup>	
Video	iSight camera; Mini DisplayPort output port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)	
Display	13.3-inch (diagonal) LED-backlit glossy widescreen display, 1280-by-800 resolution	
Expansion	One FireWire 800 port (up to 800 Mbps), two USB 2.0 ports (up to 480 Mbps), SD card slot	
Audio	Stereo speakers with subwoofers, omnidirectional microphone, combined headphone/line in (supports digital output)	
Networking	10/100/1000BASE-T (Gigabit) Ethernet	
Wireless	AirPort Extreme Wi-Fi (based on IEEE 802.11n specification) <sup>2</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology	
Hardware accessories	60W MagSafe Power Adapter, AC wall plug, power cord	
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
Apple and the global environment	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 1TB or 2TB server-grade hard drive
- Wi-Fi Certified for 802.11n 2.0
- USB port for connecting a USB printer or USB external hard drive

### Configure to order

- 320GB (5400-rpm) hard drive
- 500GB (5400-rpm) hard drive
- 128GB, 256GB, or 512GB solid-state drive
- Up to 8GB of 1066MHz DDR3 SDRAM
- Apple Remote
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan
- Aperture
- Final Cut Express
- Logic Express
- iWork

### Accessories

- Apple LED Cinema Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Magic Mouse
- Apple Keyboard with Numeric Keypad
- Apple Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. MacBook Pro achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.
  5. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  6. 1GB=1 billion bytes; actual formatted capacity less.
  7. 13-inch MacBook Pro testing conducted by Apple in March 2010 using preproduction 2.66GHz Intel Core 2 Duo-based MacBook Pro units. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processor document with display brightness set to the middle setting.

Published Date: Dec 1, 2010

# MacBook (13-inch, Mid 2010) - Technical Specifications

## Size and weight

- Height:  
1.08 inches (2.74 cm)
- Width:  
13.00 inches (33.03 cm)
- Depth:  
9.12 inches (23.17 cm)
- Weight:  
4.7 pounds (2.13 kg)<sup>1</sup>

## Processor and memory

- 2.4GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 4GB

## Communications

- AirPort Extreme 802.11n Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Environmental Status Report

- MacBook is designed with the following features to reduce its environmental impact:
- Recyclable polycarbonate enclosure
  - Mercury-free LED-backlit display
  - Arsenic-free display glass
  - BFR-free
  - PVC-free<sup>6</sup>
  - Reduced packaging volume
  - Meets ENERGY STAR Version 5.0 requirements
  - Rated EPEAT Gold<sup>7</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB	Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)
Idle	2.6	12
Hard drive accessing	2.6	11
CD drive accessing	3.2	24

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors

**Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 768, 1024 by 640, 800 by 600, 800 by 500, 720 by 480, and 640 by 480 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

NVIDIA GeForce 320M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>

Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors

iSight camera

Mini DisplayPort

### Video output options

**DVI output** using Mini DisplayPort to DVI Adapter

**VGA output** using Mini DisplayPort to VGA Adapter

**Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)

**HDMI output** using a third-party Mini DisplayPort to HDMI adapter

## Input

- Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Audio

- Stereo speakers
- Omnidirectional microphone
- Combined headphone/line in (supports digital output)
- Support for Apple iPhone headset with microphone

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- Mini DisplayPort
- Two USB 2.0 ports (up to 480 Mbps)
- Audio in/out
- Kensington lock slot

## Storage

- 250GB 5400-rpm Serial ATA hard disk drive; optional 320GB or 500GB 5400-rpm drive<sup>4</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)

Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW

Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, and DVD+RW; 24x CD

## Battery and power<sup>5</sup>

Up to 10 hrs wireless productivity

Built-in 63.5-watt-hour lithium-polymer battery

60W MagSafe Power Adapter with cable management system

MagSafe power port

## Electrical and operating requirements

# 584\_MacBook (13-inch, Mid 2010) - Technical Specifications.pdf

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Installed software

- Mac OS X v10.6 Snow Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife (includes iPhoto, iMovie, GarageBand, iWeb, iDVD)

## What's in the box

- MacBook
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Software DVDs
- Printed and electronic documentation

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 1TB or 2TB Serial ATA server-grade hard disk drive
- 802.11n Wi-Fi
- USB port for connecting a printer or external hard drive

### Configure to order

- 320GB (5400-rpm) hard drive
- 500GB (5400-rpm) hard drive
- Up to 4GB of 1066MHz DDR3 SDRAM
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan
- Aperture
- Final Cut Express
- Logic Express
- iWork

## Accessories

- Apple LED Cinema Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Apple Magic Mouse
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. 1GB = 1 billion bytes; actual formatted capacity less.
  5. Testing conducted by Apple in April 2010 using preproduction 2.4GHz Intel Core 2 Duo-based MacBook units. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processor document with display brightness set to the middle setting.

## 584\_MacBook (13-inch, Mid 2010) - Technical Specifications.pdf

6. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
7. MacBook achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.

Published Date: Dec 21, 2012

# Mac mini (Mid 2010) - Technical Specifications

## Size and weight

- Height:  
1.4 inches (3.6 cm)
- Width:  
7.7 inches (19.7 cm)
- Depth:  
7.7 inches (19.7 cm)
- Weight:  
3.0 pounds (1.37 kg)<sup>1</sup>

## Processor and memory

- 2.4GHz or 2.66GHz Intel Core 2 Duo processor
- 3MB on-chip shared L2 cache
- 1066MHz frontside bus
- 2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 8GB

## Environmental Status Report

Mac mini is designed with the following features to reduce its environmental impact:

- BFR-free
- PVC-free<sup>2</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.0 requirements
- Rated EPEAT Gold<sup>3</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	2.4 GHz	2.66 GHz	2.4 GHz	2.66 GHz
Idle	2.7	2.9	13	15
Hard drive accessing	2.7	2.9	14	15
CD drive accessing	3.0	no value	20	no value

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Peripheral connections

- One FireWire 800 port (up to 800 Mbps)
- Four USB 2.0 ports (up to 480 Mbps)
- SD card slot

## Graphics and video support

- NVIDIA GeForce 320M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>4</sup>
- Mini DisplayPort with support for up to 2560-by-1600 resolution
- HDMI port with support for up to 1920-by-1200 resolution
- DVI output using HDMI to DVI Adapter (included)
- VGA output using Mini DisplayPort to VGA Adapter (sold separately)
- Support for extended desktop and video mirroring across both ports



# 585\_Mac mini (Mid 2010) - Technical Specifications.pdf

## Communications

- AirPort Extreme 802.11n Wi-Fi wireless networking<sup>5</sup>; IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Ethernet (RJ-45) interface with support for jumbo frames

## Audio

- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- HDMI port supports multichannel audio output
- Support for Apple iPhone headset with microphone

## Storage

- 320GB or 500GB Serial ATA hard disk drive<sup>6</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
  - Maximum read: 8x DVD-R, DVD+R, DVD-ROM, DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, and DVD+RW; 24x CD
  - Maximum write: 8x DVD-R, DVD+R; 6x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW; 8x DVD+RW; 24x CD-R; 24x CD-RW

## Configurable options

	<b>Optional Processor</b> <i>Apple Online Store only</i>	<b>Optional Drive</b> <i>Apple Online Store only</i>	<b>Standard Memory</b>	<b>Optional Memory</b> <i>Apple Online Store only</i>
<b>Mac mini</b> <b>2.4 GHz; 320 GB</b>	<b>2.66 GHz</b>	<b>500 GB</b>	<b>2 GB</b>	<b>4 GB</b> <b>8 GB</b>

## Electrical and operating requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 85W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- Typical acoustical performance
  - Sound pressure level (operator position): 14 dBA at idle<sup>7</sup>

## What's included

### In the box:

- Mac mini
- HDMI to DVI Adapter
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

### Included software:

#### Mac OS X Snow Leopard

Includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools, and more. Learn more about Mac OS X Snow Leopard

#### iLife

Includes iPhoto, iMovie, GarageBand, and iWeb. Learn more about iLife

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Express
- Final Cut Express

### Displays and Graphics

- Apple LED Cinema Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort & Wireless

- AirPort Express Base Station
- AirPort Extreme Base Station
- Time Capsule
- Apple Wireless Keyboard
- Apple Magic Mouse

### Other Accessories

- Apple Remote
- Apple Keyboard
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Internal cables only.
  3. Mac mini achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.
  4. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  5. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  6. 1GB = 1 billion bytes; actual formatted capacity less.
  7. Acoustics measured from typical operator position sitting in front of standard Mac mini system. Acoustics may vary by configuration.

Published Date: Jul 1, 2012

# Mac mini Server (Mid 2010) - Technical Specifications

## Size and weight

Height:  
1.4 inches (3.6 cm)  
Width:  
7.7 inches (19.7 cm)  
Depth:  
7.7 inches (19.7 cm)  
Weight:  
2.8 pounds (1.29 kg)<sup>1</sup>

## Processor and memory

- 2.66GHz Intel Core 2 Duo processor
- 3MB on-chip shared L2 cache
- 1066MHz frontside bus
- 4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; support for up to 8GB

## Environmental Status Report

Mac mini is designed with the following features to reduce its environmental impact:

- BFR-free
- PVC-free<sup>2</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.0 requirements
- Rated EPEAT Gold<sup>3</sup>

## Peripheral connections

- One FireWire 800 port (up to 800 Mbps)
- Four USB 2.0 ports (up to 480 Mbps)
- SD card slot

## Graphics and video support

- NVIDIA GeForce 320M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>4</sup>
- Mini DisplayPort with support for up to 2560-by-1600 resolution
- HDMI port with support for up to 1920-by-1200 resolution
- DVI output using HDMI to DVI Adapter (included)
- VGA output using Mini DisplayPort to VGA Adapter (sold separately)
- Support for extended desktop and video mirroring across both ports

## Communications

- AirPort Extreme 802.11n Wi-Fi wireless networking<sup>5</sup>; IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Ethernet (RJ-45) interface with support for jumbo frames

## Audio

- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- HDMI port supports multichannel audio output
- Support for Apple iPhone headset with microphone

## Storage

- Dual 500GB 7200-rpm Serial ATA hard disk drives<sup>6</sup>

## Electrical and operating requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 85W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- Typical acoustical performance
  - Sound pressure level (operator position): 15 dBA at idle<sup>7</sup>

## What's included

### In the box:

- Mac mini
- HDMI to DVI Adapter
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

### Included software:

#### Mac OS X Server v10.6 Snow Leopard

Unlimited-Client License

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Express
- Final Cut Express

### Displays and Graphics

- Apple LED Cinema Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort & Wireless

- AirPort Express Base Station
- AirPort Extreme Base Station
- Time Capsule
- Apple Wireless Keyboard
- Apple Magic Mouse

### Other Accessories

- Apple Remote
- Apple Keyboard
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. PVC-free external cables in North America only.
  3. Mac mini achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.
  4. Memory available to Mac OS X Server may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  5. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not

# 586\_Mac mini Server (Mid 2010) - Technical Specifications.pdf

currently compatible with AirPort.

6. 1GB = 1 billion bytes; actual formatted capacity less.

7. Acoustics measured from desktop server usage position of standard Mac mini with Snow Leopard Server system. Acoustics may vary by configuration.

Published Date: Jul 1, 2012

# iPhone 4 - Technical Specifications

## Size and weight<sup>1</sup>

Height:

4.5 inches (115.2 mm)

Width:

2.31 inches (58.6 mm)

Depth:

0.37 inch (9.3 mm)

Weight:

4.8 ounces (137 grams)

## Cellular and wireless

- GSM model: UMTS/HSDPA/HSUPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
- CDMA model: CDMA EV-DO Rev. A (800, 1900 MHz)
- 802.11b/g/n Wi-Fi (802.11n 2.4GHz only)
- Bluetooth 2.1 + EDR wireless technology

## Location

- Assisted GPS
- Digital compass
- Wi-Fi
- Cellular

## Power and battery<sup>2</sup>

- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter
- Talk time:

Up to 7 hours on 3G

Up to 14 hours on 2G (GSM model only)

- Standby time: Up to 300 hours
- Internet use:

Up to 6 hours on 3G

Up to 10 hours on Wi-Fi

- Video playback: Up to 10 hours
- Audio playback: Up to 40 hours

## Mac system requirements

- Mac computer with USB 2.0 port
- Mac OS X v10.5.8 or later
- iTunes 10.1 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))
- iTunes Store account
- Internet access

## Windows system requirements

- PC with USB 2.0 port
- Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
- iTunes 10.1 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))
- iTunes Store account
- Internet access

## Environmental requirements

# 587\_iPhone 4 - Technical Specifications.pdf

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Capacity<sup>3</sup>

- 16GB or 32GB flash drive

## Display

- Retina display
- 3.5-inch (diagonal) widescreen Multi-Touch display
- 960-by-640-pixel resolution at 326 ppi
- 800:1 contrast ratio (typical)
- 500 cd/m<sup>2</sup> max brightness (typical)
- Fingerprint-resistant oleophobic coating on front and back
- Support for display of multiple languages and characters simultaneously

## Audio playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and video

- Video formats supported: H.264 video up to 720p, 30 frames per second, Main Profile level 3.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format
- Support for 1024 by 768 pixels with Dock Connector to VGA Adapter; 576p and 480p with Apple Component AV Cable; 576i and 480i with Apple Composite AV Cable (cables sold separately)

## Languages

- Language support for English (U.S.), English (UK), French (France), German, Traditional Chinese, Simplified Chinese, Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese, Russian, Polish, Turkish, Ukrainian, Hungarian, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, Croatian, Catalan, and Vietnamese
- Keyboard support for English (U.S.), English (UK), French (France), French (Canadian), French (Switzerland), German, Traditional Chinese (Handwriting, Pinyin, Zhuyin, Cangjie, Wubihua), Simplified Chinese (Handwriting, Pinyin, Wubihua), Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese (Romaji, Ten Key), Japanese (Kana), Russian, Polish, Turkish, Ukrainian, Estonian, Hungarian, Icelandic, Lithuanian, Latvian, Flemish, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, Croatian, Bulgarian, Serbian (Cyrillic/Latin), Catalan, Vietnamese, Tibetan, Macedonian, and Cherokee
- Dictionary support (enables predictive text and autocorrect) for English (U.S.), English (UK), French, German, Traditional Chinese, Simplified Chinese, Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese (Romaji), Japanese (Kana), Russian, Polish, Turkish, Ukrainian, Hungarian, Lithuanian, Flemish, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malaysian, Romanian, Slovak, Croatian, Catalan, Vietnamese, and Cherokee

## Camera, photos, and video

- Video recording, HD (720p) up to 30 frames per second with audio
- 5-megapixel still camera
- VGA-quality photos and video at up to 30 frames per second with the front camera
- Tap to focus video or still images
- LED flash
- Photo and video geotagging

## External buttons and controls

- On/off

# 587\_iPhone 4 - Technical Specifications.pdf

- Sleep/wake
- Ring/silent
- Volume up/down
- Home

## Sensors

- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Connectors and input/output

- 30-pin dock connector
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Microphone

## Headphones

- Apple Earphones with Remote and Mic
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Rating for hearing aids<sup>4</sup>

### iPhone 4 (GSM model)

- 3G network - 850/1900MHz: M4, T4
- 2G network - 850MHz: M3, T3
- 2G network - 1900MHz: M2, T3

### iPhone 4 (CDMA model)

- M4, T4

## In the box

- iPhone 4
- Apple Earphones with Remote and Mic
- Dock Connector to USB Cable
- USB Power Adapter
- Documentation

## Environmental Status Report

iPhone 4 embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- PVC-free handset
- PVC-free headphones
- PVC-free USB cable
- Bromine-free printed circuit boards
- Mercury-free LCD display
- Arsenic-free display glass
- Majority of packaging made from post-consumer recycled fiberboard and biobased materials
- Power adapter outperforms strictest global energy efficiency standards

## Mail attachment support

- Viewable document types: .jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel)

## Bumpers for iPhone 4



# 587\_iPhone 4 - Technical Specifications.pdf

Dress up your iPhone 4 with a Bumper. Choose one of six colors — white, black, blue, green, orange, or pink — and slip it around the edge of your iPhone 4. With metal buttons for volume and power, two-tone colors, and a combination of rubber and molded plastic, Bumpers add a touch of style to any iPhone 4.

## Accessories

### **Apple In-Ear Headphones with Remote and Mic**

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing.

### **Apple Earphones with Remote and Mic**

These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.

### **Apple USB Power Adapter**

Use this ultracompact USB-based adapter to charge your iPhone whenever it's not connected to a computer.

### **iPhone 4 Dock**

### **iPhone 4 Dock Inserts**

### **Apple Dock Connector to USB Cable**

### **Apple Dock Connector to VGA Adapter**

### **iPhone TTY Adapter**

### **Apple Component AV Cable**

### **Apple Composite AV Cable**

### **AirPort Extreme Base Station**

### **Nike + iPod Sensor**

### **World Travel Adapter Kit**

- 
1. Actual size and weight vary by configuration and manufacturing process.
  2. All battery claims depend on network configuration and many other factors; actual results will vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced by an Apple service provider. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. For more details of iPhone performance tests for talk time, standby time, Internet use over 3G, Internet use over Wi-Fi, video playback, and audio playback, see [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html).
  3. 1GB = 1 billion bytes; actual formatted capacity less.
  4. Based on testing conducted by an independent laboratory following the ANSI standard C633.19, "American National Standard for Methods of Measurement of Compatibility between Wireless Communications Devices and Hearing Aids."

Published Date: Feb 19, 2014

# iMac (21.5-inch, Mid 2010) - Technical Specifications

## Processor and memory

- 3.06GHz Intel Core i3 processor with 4MB level 3 cache; supports Hyper-Threading
- 3.2GHz Intel Core i3 processor with 4MB level 3 cache; supports Hyper-Threading
- 3.6GHz Intel Core i5 processor with 4MB level 3 cache; supports Hyper-Threading and Turbo Boost

4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 SDRAM; four SO-DIMM slots support up to 16GB

## Size and weight

- Height: 17.75 inches (45.1 cm)
- Width: 20.8 inches (52.8 cm)
- Depth: 7.42 inches (18.85 cm)
- Weight: 20.5 pounds (9.3 kg)<sup>1</sup>

## Connections and expansion

- One FireWire 800 port; 7 watts
- Four USB 2.0 ports
- SDXC card slot

## Communications

- AirPort Extreme 802.11n Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Two internal 17-watt high-efficiency amplifiers
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone
- Support for Apple iPhone headset with microphone

## Environmental Status Report

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR 5.0 requirements
- Rated EPEAT Gold<sup>4</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	21.5-inch, 3.06 GHz	21.5-inch, 3.2 GHz	21.5-inch, 3.06 GHz	21.5-inch, 3.2 GHz
Idle	3.0	3.0	18	16
Hard drive accessing	3.0	3.0	19	16
CD drive accessing	no value	3.3	no value	22

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).  
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).  
3. 1 B (bel) = 10 dB (decibel).

# 588\_iMac (21.5-inch, Mid 2010) - Technical Specifications.pdf

## Display

- Built-in 21.5-inch (viewable) LED-backlit glossy widescreen TFT active-matrix liquid crystal display with IPS technology
- Resolution: 1920 by 1080 pixels
- Typical brightness: 330 cd/m<sup>2</sup>
- Millions of colors at all resolutions
- Typical viewing angle: 178° horizontal; 178° vertical
- 16:9 aspect ratio

## Graphics and video support

- **3.06GHz**  
ATI Radeon HD 4670 graphics processor with 256MB of GDDR3 memory
- **3.2GHz**  
ATI Radeon HD 5670 graphics processor with 512MB of GDDR3 memory
- iSight camera
- Mini DisplayPort output with support for DVI, VGA, and dual-link DVI (adapters sold separately)
- Support for extended desktop and video mirroring modes
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display

## Storage<sup>5</sup>

- **3.06GHz**  
500GB 7200-rpm Serial ATA hard drive
- **3.2GHz**  
1TB 7200-rpm Serial ATA hard drive  
*Optional 2TB 7200-rpm Serial ATA hard drive*

## Optical drive

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
  - Writes DVD+R DL and DVD-R DL discs at up to 4x speed
  - Writes DVD-R and DVD+R discs at up to 8x speed
  - Writes DVD-RW discs at up to 6x speed and DVD+RW discs at up to 8x speed
  - Reads DVDs at up to 8x speed
  - Writes CD-R discs at up to 24x speed
  - Writes CD-RW discs at up to 16x speed
  - Reads CDs at up to 24x speed

## Electrical and operating requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 241W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -4° to 116° F (-20° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- Typical acoustical performance
  - Sound pressure level (operator position): 18 dBA at idle<sup>6</sup>

## What's included

### In the box:

- iMac
- Apple Wireless Keyboard
- Magic Mouse
- Cleaning cloth
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

### Included software:

### Mac OS X Snow Leopard

Includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player,

# 588\_iMac (21.5-inch, Mid 2010) - Technical Specifications.pdf

Photo Booth, Front Row, Xcode Developer Tools, and more. Learn more about Mac OS X Snow Leopard

## iLife

Includes iPhoto, iMovie, GarageBand, and iWeb. Learn more about iLife

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Express
- Final Cut Express

### Displays and Graphics

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort & Wireless

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station

### Other Accessories

- Magic Trackpad
- Apple Battery Charger
- VESA Mount Adapter Kit
- AppleCare Protection Plan

### Limited warranty and service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.

### Apple and the global environment

Learn more about Apple's dedication to reducing the environmental impact of our products and process. The Apple Product Environmental Specification details the environmental attributes of our products.

### Recycling

Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.

- 
1. Weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. iMac achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.
  5. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  6. Acoustics measured on standard 21.5-inch iMac systems. Acoustics may vary by configuration.

Published Date: Dec 11, 2013

# Mac Pro (Mid 2010) - Technical Specifications

## Size and weight

Height:

**20.1** inches (51.1 cm)

Width:

**8.1** inches (20.6 cm)

Depth:

**18.7** inches (47.5 cm)

Weight:

8-core **41.2** pounds (18.7 kg)<sup>1</sup>

Quad-core **39.9** pounds (18.1 kg)<sup>1</sup>

## Processing

- **8-core (standard configuration)**
  - Two 2.4GHz Quad-Core Intel Xeon E5620 “Westmere” processors
  - 12MB of fully shared L3 cache per processor
  - Turbo Boost dynamic performance up to 2.66GHz
  - Hyper-Threading technology for up to 16 virtual cores
- **Quad-core (standard configuration)**
  - One 2.8GHz Quad-Core Intel Xeon W3530 “Nehalem” processor
  - 8MB of fully shared L3 cache per processor
  - Turbo Boost dynamic performance up to 3.06GHz
  - Hyper-Threading technology for up to 8 virtual cores
- **Advanced Intel microarchitecture**
  - Integrated memory controller
  - 128-bit SSE4 SIMD engine
  - 64-bit data paths and registers
  - Optimized for energy efficiency

## Connections and audio

- Four FireWire 800 ports (two on front panel, two on back panel)
- Five USB 2.0 ports (two on front panel, three on back panel)
- Two USB 2.0 ports on included keyboard
- Front-panel headphone minijack and internal speaker
- Optical digital audio input and output TOSLINK ports
- Analog stereo line-level input and output minijacks
- Multichannel audio through Mini DisplayPort

## Graphics and displays

- Double-wide, 16-lane PCI Express 2.0 graphics slot with one of the following graphics cards installed:
  - ATI Radeon HD 5770 with 1GB of GDDR5 memory, PCI Express 2.0, two Mini DisplayPort outputs, and one dual-link DVI port
  - ATI Radeon HD 5870 with 1GB of GDDR5 memory, PCI Express 2.0, two Mini DisplayPort outputs, and one dual-link DVI port
- Option to install two ATI Radeon HD 5770 cards
- Support for up to six displays<sup>2</sup>
- Support for digital resolutions up to 2560 by 1600 pixels
- Support for analog resolutions up to 2048 by 1536 pixels
- Video adapters available for:
  - Additional DVI output using Mini DisplayPort to DVI Adapter (optional)
  - Additional dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (optional)
  - VGA output using Mini DisplayPort to VGA Adapter or DVI to VGA Display Adapter (optional)

## Memory

- **Dual-processor systems**
  - 2.4GHz system: 1066MHz DDR3 ECC SDRAM
  - 2.66GHz and 2.93GHz systems: 1333MHz DDR3 ECC SDRAM
  - Eight memory slots (four per processor) supporting up to 64GB of main memory using 1GB, 2GB, 4GB, or 8GB DIMMs
- **Single-processor systems**
  - 2.8GHz and 3.2GHz systems: 1066MHz DDR3 ECC SDRAM
  - 3.33GHz system: 1333MHz DDR3 ECC SDRAM
  - Four memory slots supporting up to 32GB of main memory using 1GB, 2GB, 4GB, or 8GB DIMMs

## Communications

- Built-in AirPort Extreme 802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + Enhanced Data Rate (EDR) wireless technology
- Two independent 10/100/1000BASE-T Ethernet (RJ-45) interfaces with support for jumbo frames

## Environmental Status Report

- BFR-free
- PVC-free (internal cables)
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.0 requirements<sup>4</sup>
- Rated EPEAT Gold<sup>4</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level, Operator Position $L_{pAm}$ (dB)	
	2.8 GHz	2.4 GHz	2.8 GHz	2.4 GHz
Idle	3.6	3.6	26	25
Hard drive accessing	3.7	3.6	26	26
CD drive accessing	4.6	4.6	37	37

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Electrical and operating requirements

- Line voltage: 100-120V AC or 200-240V AC (wide-range power supply input voltage)
- Frequency: 50Hz to 60Hz single phase
- Current: Maximum of 12A (low-voltage range) or 5A (high-voltage range)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet

## PCI Express expansion

- Three open full-length PCI Express expansion slots<sup>5</sup>
  - One PCI Express 2.0 x16 slot
  - Two PCI Express 2.0 x4 slots
- All slots provide mechanical support for 16-lane cards
- 300W combined maximum for all PCI Express slots

## Storage

- Four 3.5-inch cable-free, direct-attach drive bays with built-in independent 3Gb/s Serial ATA channels; four internal drive carriers included
- Up to 8TB of internal storage<sup>6</sup> in bays 1 through 4 using hard drives or solid-state drives in the following capacities:
  - 1TB or 2TB hard drives, Serial ATA 3Gb/s, 7200 rpm, 32MB cache
  - 512GB solid-state drive, Serial ATA 3Gb/s
- Optional Mac Pro RAID Card with 512MB cache and 72-hour cache battery backup<sup>7</sup>
- 18x SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)
  - Writes DVD+R and DVD-R discs at up to 18x speed
  - Writes DVD+R DL and DVD-R DL discs at up to 8x speed
  - Writes DVD+RW discs at up to 8x speed
  - Writes DVD-RW discs at up to 6x speed
  - Reads DVDs at up to 18x speed
  - Writes CD-R and CD-RW discs at up to 32x speed
  - Reads CDs at up to 32x speed
- One open optical drive bay for optional second SuperDrive

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## What's included

### In the box:

- Mac Pro
- Power cord
- Apple Keyboard with Numeric Keypad
- Magic Mouse
- USB keyboard extension cable
- Install/restore DVDs
- Printed and electronic documentation

### Included software:

#### Mac OS X Snow Leopard

Includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, and Xcode Developer Tools.

#### iLife

Includes iPhoto, iMovie, iDVD, iWeb, and GarageBand.

## Accessories

### Upgrades

- 1GB Memory Kit
- 2GB Memory Kit
- 4GB Memory Kit
- 1TB SATA Drive Kit
- 2TB SATA Drive Kit
- 512GB Solid-State Drive Kit
- Mac Pro RAID Card
- ATI Radeon HD 5770 Graphics Upgrade Kit
- Apple Dual-Channel 4Gb Fibre Channel PCI Express Card
- Apple Quad-Channel 4Gb Fibre Channel PCI Express Card

### Software

- Final Cut Studio
- Final Cut Express
- Aperture
- Logic Studio
- Logic Express
- Mac OS X Server v10.6 (Unlimited-client license)
- Apple Remote Desktop
- iWork
- FileMaker

### Display and Graphics

- Apple LED Cinema Display
- VESA Mount Adapter Kit
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort and Wireless

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station
- Apple Wireless Keyboard
- Magic Trackpad

## Configuration Options

**Quad-Core (MC560LL/A)**

**8-Core (MC561LL/A)**

**12-Core  
(Apple Online Store only)**

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Processor	2.8GHz Quad-Core Intel Xeon “Nehalem”	Two 2.4GHz Quad-Core Intel Xeon “Westmere”	Two 2.66GHz 6-Core Intel Xeon “Westmere”
Cache	8MB fully shared L3 cache	12MB fully shared L3 cache per processor	
Memory	3GB (three 1GB DIMMs) of 1066MHz DDR3 ECC SDRAM	6GB (six 1GB DIMMs) of 1066MHz DDR3 ECC SDRAM	6GB (six 1GB DIMMs) of 1333MHz DDR3 ECC SDRAM
PCI Express 2.0 graphics	ATI Radeon HD 5770 with 1GB GDDR5 memory, two Mini DisplayPort outputs, and one dual-link DVI video output		
Hard disk drive	1TB Serial ATA (3Gb/s); 7200 rpm		
Optical drive	18x SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)		
Wireless	Built-in AirPort Extreme 802.11n Wi-Fi <sup>3</sup> and Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology		
PCI Express	Three open full-length PCI Express 2.0 expansion slots with mechanical support for 16-lane cards; 300W combined maximum for all PCI Express slots		

Build-to-Order Options	<ul style="list-style-type: none"><li>• Quad-Core: 2.8GHz Intel Xeon “Nehalem”</li><li>• Quad-Core: 3.2GHz Intel Xeon “Nehalem”</li><li>• 6-Core: 3.33GHz Intel Xeon “Westmere”</li><li>• 6GB memory (three 2GB DIMMs)</li><li>• 8GB memory (four 2GB DIMMs)</li><li>• 12GB memory (three 4GB DIMMs)</li><li>• 16GB memory (four 4GB DIMMs)</li><li>• ATI Radeon HD 5870 with 1GB GDDR5</li><li>• Two ATI Radeon HD 5770</li><li>• Drive bays 1-4: 1TB or 2TB Serial ATA 3Gb/s hard drive (7200 rpm); 512GB solid-state drive<sup>6</sup></li><li>• Mac Pro RAID Card<sup>7</sup></li><li>• Two 18x SuperDrive optical drives</li><li>• Apple Keyboard</li><li>• Apple Wireless Keyboard</li><li>• Magic Trackpad</li><li>• Dual-Channel 4Gb Fibre Channel card</li><li>• Quad-Channel 4Gb Fibre Channel card</li></ul>	<ul style="list-style-type: none"><li>• 8-Core: Two 2.4GHz Intel Xeon “Westmere”</li><li>• 12-Core: Two 2.66GHz Intel Xeon “Westmere”</li><li>• 12-Core: Two 2.93GHz Intel Xeon “Westmere”</li><li>• 8GB memory (four 2GB DIMMs)</li><li>• 12GB memory (six 2GB DIMMs)</li><li>• 16GB memory (eight 2GB DIMMs)</li><li>• 24GB memory (six 4GB DIMMs)</li><li>• 32GB memory (eight 4GB DIMMs)</li><li>• ATI Radeon HD 5870 with 1GB GDDR5</li><li>• Two ATI Radeon HD 5770</li><li>• Drive bays 1-4: 1TB or 2TB Serial ATA 3Gb/s hard drive (7200 rpm); 512GB solid-state drive<sup>6</sup></li><li>• Mac Pro RAID Card<sup>7</sup></li><li>• Two 18x SuperDrive optical drives</li><li>• Apple Keyboard</li><li>• Apple Wireless Keyboard</li><li>• Magic Trackpad</li><li>• Dual-Channel 4Gb Fibre Channel card</li><li>• Quad-Channel 4Gb Fibre Channel card</li></ul>	<ul style="list-style-type: none"><li>• 12-Core: Two 2.93GHz Intel Xeon “Westmere”</li><li>• 8GB memory (four 2GB DIMMs)</li><li>• 12GB memory (six 2GB DIMMs)</li><li>• 16GB memory (eight 2GB DIMMs)</li><li>• 24GB memory (six 4GB DIMMs)</li><li>• 32GB memory (eight 4GB DIMMs)</li><li>• ATI Radeon HD 5870 with 1GB GDDR5</li><li>• Two ATI Radeon HD 5770</li><li>• Drive bays 1-4: 1TB or 2TB Serial ATA 3Gb/s hard drive (7200 rpm); 512GB solid-state drive<sup>6</sup></li><li>• Mac Pro RAID Card<sup>7</sup></li><li>• Two 18x SuperDrive optical drives</li><li>• Apple Keyboard</li><li>• Apple Wireless Keyboard</li><li>• Magic Trackpad</li><li>• Dual-Channel 4Gb Fibre Channel card</li><li>• Quad-Channel 4Gb Fibre Channel card</li></ul>

1. Actual weight varies by configuration and manufacturing process.  
2. Connecting more than three displays requires installation of two ATI Radeon HD 5770 graphics cards.  
3. Wireless Internet access requires a wireless access point and Internet access; fees may apply.  
4. Mac Pro systems configured with a Fibre Channel card or Mac OS X Server do not meet ENERGY STAR and EPEAT requirements.  
5. PCI Express slots are not compatible with PCI or PCI-X expansion cards.  
6. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.  
7. Solid-state drives are not compatible with the Mac Pro RAID Card in either RAID or Enhanced JBOD mode.



# AirPort Extreme Base Station (no modem) - Technical Specifications

This article has been archived and is no longer updated by Apple.

Configurations	
Order number	<b>AirPort Extreme Base Station</b> (without modem or antenna port) <b>M8930LL/A</b>
Wireless protocol (1)	802.11g
Users supported	50
10/100BASE-T Ethernet WAN port	Yes
10/100BASE-T Ethernet LAN port	Yes
Wireless bridging (2)	Yes
USB port (3)	Yes
Internal antenna	Yes
External antenna connector (4)	Yes
56K V.90 modem (5)	No
Power over Ethernet (IEEE 802.3af) support(6)	No
Conformance to UL 2043	No
Service and support	90 days of free telephone support and one-year limited warranty

Configurations		
Order number	<b>AirPort Extreme Card</b> <b>M8881LL/A</b>	<b>AirPort Card</b> <b>M7600LL/E</b>
Wireless protocol (1)	802.11g	802.11b
Service and support	90 days of free telephone support and one-year limited warranty	

Additional Information	
<b>System Requirements</b>	<p><b>For Macintosh users:</b></p> <p>Computer hardware:</p> <ul style="list-style-type: none"><li>■ A Macintosh computer with an AirPort Extreme Card or AirPort Card</li></ul> <p>Users with Mac OS X v10.3 or later can:</p> <ul style="list-style-type: none"><li>■ Access an AirPort wireless network</li><li>■ Set up an AirPort Extreme Base Station</li><li>■ Share a USB printer</li><li>■ Use Wi-Fi Protected Access (WPA)</li><li>■ Use the AirPort Client Monitor and AirPort Management Utility (Education and Business use)</li></ul> <p>Users with Mac OS X v10.2.7 can:</p> <ul style="list-style-type: none"><li>■ Access an AirPort wireless network</li><li>■ Set up an AirPort Extreme Base Station</li><li>■ Share a USB printer</li></ul> <p><b>For PC users:</b></p> <ul style="list-style-type: none"><li>■ A PC with a Wi-Fi-certified IEEE 802.11b or 802.11g wireless card</li><li>■ Windows XP or Windows 2000</li><li>■ WPA support requires a Wi-Fi-certified PC solution</li></ul>
Other Products	Directional Antenna T6051LL/A Omnidirectional Antenna T6052ZM/A
Extended Service and Support	Purchase the AppleCare Protection Plan to extend the service and support for AirPort Card or AirPort Extreme Card and AirPort Extreme Base Station.

## Technical Specifications

# 58\_AirPort Extreme Base Station (no modem) - Technical Specifications.pdf

## Wireless data rates (1)

- Up to 54 Mbps for AirPort Extreme-enabled and other Wi-Fi Certified 802.11g computers (data rate depends on environment)
- Up to 11 Mbps for AirPort-enabled and other Wi-Fi 802.11b-enabled computers (data rate depends on environment)

## Range (2)

- 50-foot range from the base station in typical use at 54 Mbps data rate (range depends on building construction) (1)
- 150-foot range from the base station in typical use at 11 Mbps data rate (range depends on building construction)

## Frequency band

- 2.4GHz

## Radio output power

- 15dBm

## Size and weight

- Diameter: 6.9 inches (175mm)
- Height: 3.2 inches (80mm)
- Weight (without wall mounting bracket): 1.25 pounds (565grams) (7)

## Position options

- Desktop or wall (wall mounting bracket included)
- Air-handling space (available on one model)

## More Information

AirPort Extreme Technology Overview

Designing AirPort Extreme Networks

## Compatibility

- Wi-Fi Certified for 802.11b and 802.11g interoperability (1)
- Mac computers and Windows-based PCs
- NAT, DHCP, FTP, PPPoE, VPN Passthrough (IPSec, PPTP and L2TP), QuickTime Streaming, DNS Proxy, SNMP
- America Online (8)
- Cisco LEAP client support to connect to Cisco LEAP access points.

## Interfaces

- 10/100BASE-T Ethernet WAN port (RJ-45 connector) for connecting a DSL or cable modem
- 10/100BASE-T Ethernet LAN port (RJ-45 connector) for connecting to wired computers and printers
- USB port for connecting a USB printer(3)
- External antenna connector for connecting external directional or omnidirectional antennas
- Power port for included power adapter

## Security

- Wi-Fi Protected Access™ (WPA) (9)
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS

## Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, ARIB STD-T66, RCR STD-T33, AS/NZS 4771:2000, UL 60950, CSA-C22.2 No. 60950
- Conforms to UL 2043 for use in air-handling spaces (available on one model of the AirPort Extreme Base Station)

## Included software

AirPort Extreme Base Station software:

- AirPort Setup Assistant to configure the computer and base station for Internet access
- AirPort Admin Utility for base station setup and network administration
- AirPort Client Monitor to gauge the signal quality of a base station at various locations (for education and business use; included with one model)
- AirPort Management Utility to administer groups of base stations efficiently (for education and business use; included with one model)

## AirPort Card software:

- Internet Connect to connect to and disconnect from your ISP, monitor connection status, turn AirPort Extreme on and off, change networks, and check signal quality
- AirPort menu bar status icon to monitor connection status, measure signal quality, change networks, and turn AirPort on and off

## Electrical and environmental requirements

- 100-240V AC, 50-60Hz, Input Current: 0.4 Amps (AirPort Extreme Base Station)
- 100-240V AC, 50-60Hz, Input Current: 0.2 Amps (AirPort Express Base Station)
- Power over Ethernet: IEEE 802.3af PD, Class 0 (available on one model of the AirPort Extreme Base Station)
- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13°to 140° F ( -25° to 60° C)
- Relative humidity (operating): 20% to 90%, noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Channels

- Channels 1-11 approved for use in the United States, Canada, Latin America, and Taiwan
- Channels 1-14 approved for use in Japan
- Channels 1-13 approved for use in other countries

1. AirPort Extreme uses the 802.11g wireless standard. Accessing the wireless network requires an AirPort or AirPort Extreme enabled computer or Wi-Fi-certified 802.11b or 802.11g computer. Achieving data rates of 54 Mbps requires that all users have an AirPort Extreme or Wi-Fi-certified 802.11g enabled computer and connect to an AirPort Express or AirPort Extreme Base Station. If a user of a Wi-Fi-certified 802.11b product joins the network, that user will get up to 11 Mbps and AirPort Extreme and Wi-Fi-certified 802.11g users will get less than 54 Mbps. Actual speed will vary based on range, connection rate, site conditions, size of network, and other factors.
2. AirPort Extreme can extend the range only of an AirPort Extreme or AirPort Express wireless network.
3. Wireless printing over USB requires Mac OS X v10.2.7 or later or Windows XP or Windows 2000 and a compatible printer.
4. For use with Apple-approved antennas only. Antennas sold separately.
5. Actual modem speeds lower; speed depends on connection rate and other factors.
6. Weight varies by configuration and manufacturing process.
7. Compatible with AOL 5.0 or later in the U.S. only. Simultaneous sharing of an AOL connection requires multiple AOL accounts.
8. Support for WPA requires Mac OS X v10.3 or later. Use of Wi-Fi Protected Access (WPA) reduces the maximum number of network users.

Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort Extreme.

Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

# iTunes 10.7 for Mac - Technical Specifications

## Software:

- Mac OS X version 10.6.8 or later
- Safari 4.0.3 or later
- 400MB of available disk space
- iTunes in the Cloud and iTunes Match availability may vary by country.

## Hardware:

- Mac computer with an Intel Core processor and 512MB of RAM
- To play 720p HD video, an iTunes LP, or iTunes Extras, a 2.0GHz Intel Core 2 Duo or faster processor and 1GB of RAM is required.
- To play 1080p HD video, a 2.4GHz Intel Core 2 Duo or faster processor and 2GB of RAM is required.
- Screen resolution of 1024x768 or greater; 1280x800 or greater is required to play an iTunes LP or iTunes Extras
- Broadband Internet connection to use the iTunes Store
- Apple combo drive or SuperDrive to create audio, MP3, or back-up CDs; some non-Apple CD-RW recorders may also work
- Apple SuperDrive to back up your library to DVDs; some non-Apple DVD-RW drives may also work

Published Date: Dec 3, 2012

# iTunes 10.7 for Windows - Technical Specifications

## Hardware:

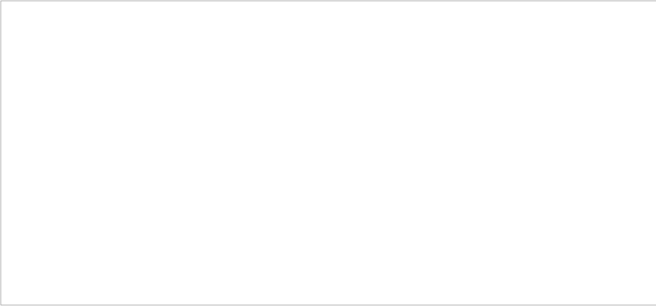
- PC with a 1GHz Intel or AMD processor and 512MB of RAM
- To play Standard Definition video from the iTunes Store, an Intel Pentium D or faster processor, 512MB of RAM, and a DirectX 9.0-compatible video card is required.
- To play 720p HD video, an iTunes LP, or iTunes Extras, a 2.0GHz Intel Core 2 Duo or faster processor, 1GB of RAM, and an Intel GMA X3000, ATI Radeon X1300, or NVIDIA GeForce 6150 or better is required.
- To play 1080p HD video, a 2.4GHz Intel Core 2 Duo or faster processor, 2GB of RAM, and an Intel GMA X4500HD; ATI Radeon HD 2400; Nvidia GeForce 8300 GS or better is required.
- Screen resolution of 1024x768 or greater; 1280x800 or greater is required to play an iTunes LP or iTunes Extras
- 16-bit sound card and speakers
- Broadband Internet connection to use the iTunes Store
- iTunes-compatible CD or DVD recorder to create audio CDs, MP3 CDs, or back-up CDs or DVDs

## Software:

- Windows XP Service Pack 2 or later, 32-bit editions of Windows Vista, or 32-bit editions of Windows 7
- 64-bit editions of Windows Vista or Windows 7 require the iTunes 64-bit installer; for more information, visit [www.itunes.com/download](http://www.itunes.com/download)
- 250MB of available disk space
- Screen reader support requires Window-Eyes 7.2 or later; for information about accessibility

Published Date: Mar 14, 2013

# iPod shuffle (4th generation) - Technical Specifications



## Colors

- Space Gray
- Gold
- Silver
- Pink
- Blue
- Red - (PRODUCT)RED

## Capacity<sup>1</sup>

- 2GB

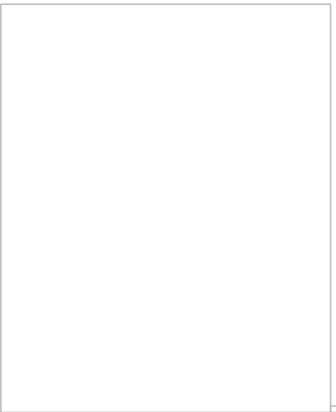
## Size and Weight

- Height: 1.14 inches (29.0 mm)
- Width: 1.24 inches (31.6 mm)
- Depth: 0.34 inch (8.7 mm) including clip
- Weight: 0.44 ounce (12.5 grams)<sup>2</sup>
- True volume: 0.35 cu. inch (5668 cu. mm) including clip

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV

## External Buttons and Connectors



## Power and Battery<sup>3</sup>

- Built-in rechargeable lithium-ion battery
- Up to 15 hours of audio playback
- Charging via USB to computer system or power adapter (sold separately)

## Languages

# 592\_iPod shuffle (4th generation) - Technical Specifications.pdf

- **29 VoiceOver languages:**

Chinese (Cantonese, Mandarin), Czech, Danish, Dutch, English (Australia, UK, and U.S.), Finnish, French (Canada, France), German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Spanish (Mexico, Spain), Swedish, Thai, Turkish

## Headphones

- Apple Earphones

## System Requirements

- Mac: USB 2 port, OS X v10.7.5 or later, and iTunes 12.2 or later<sup>4</sup>
- PC: USB 2 port, Windows 7 or later, and iTunes 12.2 or later<sup>4</sup>
- Internet access required; broadband recommended; fees may apply

## Environmental Requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## In the Box

- iPod shuffle
- Apple Earphones
- iPod shuffle USB Cable
- Quick Start guide

## iPod shuffle and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iPod shuffle is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free
- Recyclable aluminum enclosure

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPod shuffle.

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Testing conducted by Apple in August 2012 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (256-Kbps AAC). Video content was purchased from the iTunes Store. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  4. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Apr 13, 2017

# iPod nano (6th generation) - Technical Specifications

<b>Size and Weight</b>	<ul style="list-style-type: none"><li>• Height: 1.48 inches (37.5 mm)</li><li>• Width: 1.61 inches (40.9 mm)</li><li>• Depth: 0.35 inch (8.78 mm) including clip</li><li>• Weight: 0.74 ounce (21.1 grams)<sup>1</sup></li><li>• Volume: 0.614 cu. inch (10,056 cu. mm)</li></ul>
<b>Capacity<sup>2</sup></b>	<ul style="list-style-type: none"><li>• 8GB</li><li>• 16GB</li></ul>
<b>Display</b>	<ul style="list-style-type: none"><li>• 1.54-inch (diagonal) color TFT display</li><li>• 240-by-240-pixel resolution</li><li>• 220 pixels per inch</li></ul>
<b>Audio Playback</b>	<ul style="list-style-type: none"><li>• Frequency response: 20Hz to 20,000Hz</li><li>• Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV</li><li>• User-configurable maximum volume limit</li></ul>
<b>FM Radio</b>	<ul style="list-style-type: none"><li>• Regional settings for Americas, Asia, Australia, Europe, and Japan</li><li>• Live Pause feature for pausing a radio broadcast and rewinding (within a 15-minute buffer)</li></ul>
<b>Sensor</b>	<ul style="list-style-type: none"><li>• Accelerometer</li></ul>
<b>Battery and Power<sup>3</sup></b>	<ul style="list-style-type: none"><li>• Built-in rechargeable lithium-ion battery</li><li>• Up to 24 hours of music playback when fully charged</li><li>• Charging via USB to computer system or power adapter (sold separately)<ul style="list-style-type: none"><li>◦ Fast-charge time: about 1.5 hours (charges up to 80% of battery capacity)</li><li>◦ Full-charge time: about 3 hours</li></ul></li></ul>
<b>Languages</b>	<ul style="list-style-type: none"><li>• 29 UI languages: Arabic, Brazilian Portuguese, Cantonese (Traditional Chinese), Croatian, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Romanian, Russian, Simplified Chinese, Slovak, Spanish, Swedish, Thai, Traditional Chinese, Turkish</li><li>• Song, album, and artist information can also be displayed in Bulgarian, Serbian, Slovenian, Ukrainian, and Vietnamese. For Arabic and Hebrew language support, some UI elements are not right to left.</li><li>• Fitness spoken feedback is available in seven languages: Chinese (Mandarin), English (U.S.), French (France), German, Italian, Japanese, Spanish (Spain).</li><li>• 29 VoiceOver languages: Chinese (Cantonese, Mandarin), Czech, Danish, Dutch, English (Australia, UK, and U.S.), Finnish, French (Canada, France), German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Spanish (Mexico, Spain), Swedish, Thai, Turkish</li></ul>
<b>In the Box</b>	<ul style="list-style-type: none"><li>• iPod nano</li><li>• Apple Earphones</li><li>• Dock Connector to USB Cable</li><li>• Quick Start guide and Important Product Information</li></ul>
<b>Headphones</b>	<ul style="list-style-type: none"><li>• Earphones</li><li>• Frequency response: 20Hz to 20,000Hz</li><li>• Impedance: 32 ohms</li></ul>
<b>Accessibility</b>	<ul style="list-style-type: none"><li>• VoiceOver gesture-based screen reader</li><li>• High-resolution LCD display with adjustable backlight settings for easier reading in low light</li><li>• White on black display</li><li>• Mono Audio</li></ul>

# 593\_iPod nano (6th generation) - Technical Specifications.pdf

<b>System Requirements</b>	<ul style="list-style-type: none"><li>• Mac computer with USB 2.0 port, OS X v10.5.8 or later, and iTunes 10 or later<sup>4</sup></li><li>• PC with USB 2.0 port; Windows 7, Vista, or XP Home or Professional (SP3) or later; and iTunes 10 or later</li><li>• Internet access required; broadband recommended; fees may apply</li></ul>
<b>Environmental Requirements</b>	<ul style="list-style-type: none"><li>• Operating temperature: 32° to 95° F (0° to 35° C)</li><li>• Nonoperating temperature: -4° to 113° F (-20° to 45° C)</li><li>• Relative humidity: 5% to 95% noncondensing</li><li>• Maximum operating altitude: 10,000 feet (3000 m)</li></ul>

## iPod nano and the Environment

Apple takes a complete product lifecycle approach to determining our environmental impact. [Learn more](#)

### iPod nano is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- Mercury-free
- PVC-free
- Recyclable aluminum enclosure

## Apple and the Environment

Learn more about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPod.

## Accessories

### In-Ear Headphones with Remote and Mic

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing.

### Earphones with Remote and Mic

These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.

### USB Power Adapter

Use this ultracompact USB-based adapter to charge your iPhone or iPod whenever it's not connected to a computer.

### Apple Dock Connector to USB Cable

Use the Dock Connector to USB Cable to charge and sync your iPod, iPhone, or iPad with your Mac or Windows PC.

[See more accessories in the Apple Online Store](#)

- 
1. Weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Testing conducted by Apple in August 2010 using preproduction hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (256-Kbps AAC). Video content was purchased from the iTunes Store. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  4. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Oct 14, 2016



# iPod touch (4th generation) - Technical Specifications

<b>Color</b>	<ul style="list-style-type: none"> <li>• White</li> <li>• Black</li> </ul>		
<b>Capacity<sup>1</sup></b>	8GB	32GB	64GB
<b>Size and Weight<sup>2</sup></b>	<ul style="list-style-type: none"> <li>• <b>Height:</b> 4.4 inches (111.0 mm)</li> <li>• <b>Width:</b> 2.32 inches (58.9 mm)</li> <li>• <b>Depth:</b> 0.28 inch (7.2 mm)</li> <li>• <b>Weight:</b> 3.56 ounces (101 grams)</li> </ul>		
<b>Wireless<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• 802.11b/g/n Wi-Fi (802.11n 2.4GHz only)</li> <li>• Bluetooth 2.1 + EDR</li> <li>• Maps-location based service<sup>4</sup></li> <li>• Nike+ support built in<sup>5</sup></li> </ul>		
<b>Display</b>	<ul style="list-style-type: none"> <li>• 3.5-inch (diagonal) widescreen Multi-Touch display</li> <li>• 960-by-640-pixel resolution at 326 pixels per inch</li> </ul>		
<b>Camera, Photos, and Video</b>	<ul style="list-style-type: none"> <li>• Video recording, HD (720p) up to 30 frames per second with audio; still photos (960 by 720) with back camera</li> <li>• VGA-quality photos and video up to 30 frames per second with front camera</li> <li>• Tap to control exposure for video or stills</li> <li>• Photo and video geotagging over Wi-Fi</li> </ul>		
<b>Input and Output</b>	<ul style="list-style-type: none"> <li>• 30-pin dock connector</li> <li>• 3.5-mm stereo headphone minijack</li> <li>• Built-in speaker</li> <li>• Microphone</li> </ul>		
<b>Power and Battery<sup>6</sup></b>	<ul style="list-style-type: none"> <li>• Built-in rechargeable lithium-ion battery</li> <li>• Music playback time: Up to 40 hours when fully charged</li> <li>• Video playback time: Up to 7 hours when fully charged</li> <li>• Charging times: Fast charge in about 2 hours (80% capacity), full charge in about 4 hours</li> </ul>		
<b>Audio</b>	<ul style="list-style-type: none"> <li>• Frequency response: 20Hz to 20,000Hz</li> <li>• Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV</li> <li>• User-configurable maximum volume limit</li> </ul>		
<b>TV and Video</b>	<ul style="list-style-type: none"> <li>• H.264 video up to 720p, 30 frames per second, Main Profile level 3.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats</li> <li>• MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats</li> <li>• Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format</li> <li>• Support for 1024 by 768 pixels with Apple VGA Adapter; 576p and 480p with Apple Component AV Cable; 576i and 480i with Apple Composite AV Cable (cables sold separately)</li> </ul>		
<b>Headphones</b>	<ul style="list-style-type: none"> <li>• Earphones</li> <li>• Frequency response: 20Hz to 20,000Hz</li> <li>• Impedance: 32 ohms</li> </ul>		

# 594\_iPod touch (4th generation) - Technical Specifications.pdf

<b>Sensors</b>	<ul style="list-style-type: none"><li>• Three-axis gyro</li><li>• Accelerometer</li><li>• Ambient light sensor</li></ul>
<b>System Requirements</b>	<ul style="list-style-type: none"><li>• Apple ID (required for some features)</li><li>• Internet access<sup>3</sup></li><li>• Syncing with iTunes on a Mac or PC requires:<ul style="list-style-type: none"><li>◦ Mac: OS X v10.5.8 or later</li><li>◦ PC: Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later</li><li>◦ iTunes 10.5 or later (free download from <a href="http://www.itunes.com/download">www.itunes.com/download</a>)<sup>7</sup></li></ul></li></ul>
<b>Environmental Requirements</b>	<ul style="list-style-type: none"><li>• Operating temperature: 32° to 95° F (0° to 35° C)</li><li>• Nonoperating temperature: -4° to 113° F (-20° to 45° C)</li><li>• Relative humidity: 5% to 95% noncondensing</li><li>• Maximum operating altitude: 10,000 feet (3000 m)</li></ul>

## Language Support

English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

## Keyboard Support

<b>Languages</b>	English (U.S.), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Tibetan, Turkish, Ukrainian, Vietnamese

## Dictionary Support

English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, French (Canadian), French (Switzerland), German, Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Indonesian, Latvian, Lithuanian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

<b>In the Box</b>	<ul style="list-style-type: none"><li>• iPod touch</li><li>• Earphones</li><li>• Dock Connector to USB Cable</li><li>• Quick Start guide</li></ul>

## iPod touch and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

### iPod touch is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- Brominated flame retardant-free
- Mercury-free LCD display
- PVC-free
- Recyclable stainless steel enclosure

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPod.

## Accessories

### **In-Ear Headphones with Remote and Mic**

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing.

### **Earphones with Remote and Mic**

These earbud headphones have convenient buttons that let you adjust volume and control music and video playback.

### **USB Power Adapter**

Use this ultracompact USB-based adapter to charge your iPhone or iPod whenever it's not connected to a computer.

### **Apple Universal Dock**

Get easy access to a USB port for charging and syncing your iPod or for connecting to a TV or speakers.

### **Other Accessories**

- Apple Composite AV Cable
- Apple Component AV Cable
- Apple Dock Connector to USB Cable
- iPod Universal Dock Adapter 3-Pack
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Internet access required; broadband recommended; fees may apply.
  4. For iPod touch with Maps, the Maps application provides your approximate location using information based on your proximity to known Wi-Fi networks (when on and available). The more accurate the available information, the smaller the circle identifying your position on the map. The feature is not available in all areas. Known Wi-Fi networks are predominantly in urban areas. In order to provide your location, data is collected in a form that does not personally identify you. If you do not want such data collected, do not enable the feature. Not enabling the feature will not impact the functionality of your iPod touch.
  5. Requires Nike + iPod Sensor, sold separately.
  6. Testing conducted by Apple in September 2011 using preproduction iPod touch hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (256-Kbps AAC); video content was purchased from the iTunes Store. iPod units were associated to a Wi-Fi network and Auto-Brightness was turned off; all other settings were default. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced ([www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  7. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Oct 14, 2016

# Safari 5 for Mac - Technical Specifications

## Lion System Requirements

- OS X Lion v10.7.2

## Snow Leopard System Requirements

- Mac OS X Snow Leopard v10.6.8
- Security Update 2011-006

## What's new in Safari 5

- Reading List
- Multi-Touch Gestures
- Full-Screen Browsing
- New Privacy and Security Features
  - Privacy Pane
  - Sandboxing
  - Private AutoFill
- More New Features
  - Resume
  - Downloads Popover
  - Find Option
  - Better Graphics
  - Internet Account Setup
  - New Process Architecture

Published Date: Nov 8, 2011

# LED Cinema Display (27-inch) - Technical Specifications

## Size and weight

Height:	19.35 inches (49.1 cm)
Width:	25.7 inches (65 cm)
Depth (with stand):	8.15 inches (20.7 cm)
Weight:	23.5 pounds (10.7 kg)

## System Requirements

- Mac with Mini DisplayPort connector
- Mac OS X v10.6.4 or later

## Environmental Status Report

The LED Cinema Display is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- Mercury-free
- BFR-free
- PVC-free
- Highly recyclable aluminum and glass enclosure
- Meets ENERGY STAR 5.0 requirements
- Rated EPEAT Gold\*

## Display

27-inch (diagonal viewable image size) thin film transistor (TFT) active-matrix liquid crystal display with in-plane switching (IPS).

- **Supported resolutions:** 2560 by 1440 pixels, 1920 by 1080 pixels, 1280 by 720 pixels
- **Colors (maximum):** 16.7 million
- **Aspect ratio:** 16:9
- **Viewing angle:** 178° horizontal; 178° vertical
- **Brightness (typical):** 375 cd/m<sup>2</sup>
- **Contrast ratio (typical):** 1000:1
- **Response time (typical):** 12 ms

## Audio and video

- **Camera and microphone:**  
Built-in iSight with microphone
- **Speakers:** Built-in 2.1 speaker system (49 watts maximum)
- **Mini DisplayPort connector with audio support**

## What's in the box

- LED Cinema Display
- AC power cord
- Printed documentation

## Peripherals and cables

- Three self-powered USB 2.0 ports
- Kensington security slot
- One cable with three connectors: Mini DisplayPort with audio support, universal MagSafe (up to 85W), USB 2.0
- AC power cord

# 597\_LED Cinema Display (27-inch) - Technical Specifications.pdf

## Electrical and operating requirements

- Input voltage: 100V to 240V AC; 50-60Hz
- Maximum power: 250W (LED Cinema Display while charging MacBook Pro)
- Energy saver mode: 1W or less

## Environmental requirements

- Operating temperature: 50° to 95° F  
(10° to 35° C)
- Storage temperature: -4° to 116° F  
(-20° to 47° C)
- Operating humidity: 20% to 80%  
noncondensing
- Maximum operating altitude: 10,000 feet

## Additional Options

- VESA Mount Adapter Kit
- AppleCare Protection Plan

- 
- \* 27-inch LED Cinema Display achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.

Published Date: Sep 24, 2010

# Apple TV (2nd generation) - Technical Specifications

## Size and weight

Height:  
0.9 inches (23 mm)  
Width:  
3.9 inches (98 mm)  
Depth:  
3.9 inches (98 mm)  
Weight:  
0.6 pounds<sup>1</sup>

## In the box

- Apple TV
- Aluminum Apple Remote
- Power cord
- Documentation

## Environmental Status Report

- Brominated flame retardant-free
- PVC-free <sup>3</sup>
- Meets ENERGY STAR 2.0 requirements for set-top boxes

## Processor

- Apple A4 chip

## System requirements

- Wi-Fi (802.11 a, b, g, or n) wireless network (wireless video streaming requires 802.11a, g or n) or 10/100BASE-T Ethernet network
- iTunes Store account for renting movies and TV shows
- Netflix account for streaming Netflix content
- For streaming media from a Mac or PC:  
iTunes 10.2 or later; iTunes Store account for Home Sharing
- MLB.TV subscription required to watch live and archived games
- NBA.com League Pass Broadband subscription required to watch live and archived games

## Ports and interfaces

- HDMI<sup>2</sup>
- Optical audio
- 10/100BASE-T Ethernet
- Built-in IR receiver
- Micro-USB (for service and support)

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Power

- Built-in 6-watt universal power supply

## Wireless

# 598\_Apple TV (2nd generation) - Technical Specifications.pdf

- Wi-Fi (802.11a/b/g/n)

## Video formats

- H.264 video up to 720p, 30 frames per second, Main Profile level 3.1 with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- MPEG-4 video, up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Audio formats supported

- HE-AAC (V1), AAC (16 to 320 Kbps), protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Apple Lossless, AIFF, and WAV; Dolby Digital 5.1 surround sound pass-through

## Photo formats

- JPEG, GIF, TIFF

## TV compatibility

- Compatible with high-definition TVs with HDMI and capable of 720p 60/50Hz,<sup>2</sup> including popular models from these manufacturers: Hitachi, JVC, LG, Mitsubishi, NEC, Panasonic, Philips, Pioneer, Samsung, Sony, Sharp, Toshiba, Vizio, Westinghouse

## Accessories

- Apple HDMI to HDMI Cable
- Digital Optical Audio Cable
- AppleCare Protection Plan

## iTunes Movie and TV Show Rentals<sup>4</sup>

	Resolution	Audio
<b>HD Movie</b>	1280 x 720 (maximum)	Dolby Digital 5.1 surround sound (not all titles)
<b>SD Movie</b>	720 x 480 anamorphic (maximum)	Dolby Digital 5.1 surround sound (not all titles)
<b>HD TV Show</b>	1280 x 720 (maximum)	Dolby Digital 5.1 surround sound (not all titles)
<b>SD TV Show</b>	720 x 480 anamorphic (maximum)	Dolby Digital 5.1 surround sound (not all titles)

- 
1. Weight varies by configuration and manufacturing process.
  2. Requires HDCP when playing protected content.
  3. PVC-free AC power cord available in the United States and Canada.
  4. A sustained 6 Mbit/s or faster Internet connection is recommended for viewing High Definition movies and TV shows, and a sustained 2.5 Mbit/s or faster Internet connection is recommended for Standard Definition content. Internet connection speeds may vary depending on your ISP and other factors.

Published Date: Feb 24, 2017



# Logic Pro 7 - Technical Specifications

Logic Pro 7 - Part Numbers	
Retail	<b>M9664Z/A</b>
Upgrade from Pro, Platinum, Gold 5 or 6	<b>M9667Z/A</b>
Logic Pro 7 Upgrade from Logic Express 6,7 and Big Box	<b>M9668Z/A</b>

## Logic Pro 7 System Requirements

- Macintosh computer with PowerPC G4 or faster processor (G5 or dual G4 processors recommended).
- PowerPC G5 and Gigabit Ethernet connectivity for Logic Node applications.
- Mac OS X v10.3 or later.
- 512 MB of RAM.
- DVD drive for software installation.
- Available USB port for XSKey (copy protection).
- Low-latency multi-I/O audio hardware and MIDI interface recommended.
- 4GB of available hard drive space.

## Powerful audio production

- Network-distributed audio processing to expand power for software instruments and effects.
- Track Freeze to extend processing capability for a single computer.
- High-end POW-r dithering algorithm.
- Audio resolution up to 24-bit/192kHz.
- Shuffle and Auto-Crossfade Arrange Edit modes.

## Award-winning instruments and effects

- 34 software instruments, including Sculpture; Ultrabeat; EVP88, EVB3, and EVD6 vintage instruments; and ES1, ES2, EFM1, ESM, ESP and ESE synthesizers.
- EXS24 mk II sampler with comprehensive sampler instrument library.
- Over 70 effect plug-ins, including Guitar Amp Pro, Ringshifter, Linear Phase EQ, Match EQ, Vocal Transformer, EVOC20 Vocoder, Space Designer convolution reverb and Pitch Correction.

## Professional mixing and automation

- Adaptive Track Mixer for display of selected channels.
- Save/Load Channel Strip instrument and plug-in configurations.
- Sample-accurate, track-based 32-bit automations.
- Extensive Channel group functions for mix and edit.
- Up to 255 stereo tracks.
- 64 buses, 64 auxiliary channels.
- 15 inserts, 8 sends per channel.
- Support for multiple surround formats, including 5.1 and 7.1.
- Comprehensive hardware controller support.

## Advanced MIDI sequencing

- Matrix, Event List, Hyper, Score and Transform MIDI edit windows.
- Layout and printing of complete professional scores.
- Caps Lock conversion of computer keys into musical keyboard.

## Comprehensive control

- More than 800 definable key and MIDI commands.
- 90 recallable screen configurations with interactive edit windows.
- Project Manager for powerful control of assets.
- Setup Assistant for easy system configuration.

# 599\_Logic Pro 7 - Technical Specifications.pdf

- Fast, offline bouncing of single or multiple tracks.
- Tempo, Signature, Chord, Transpose, Beat-Mapping and Video Tracks.

Published Date: Oct 16, 2010

# PowerBook G4 (12-inch) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (12-inch) - Technical Specifications

Configurations	
Order number	M8760LL/A
Processor	867MHz PowerPC G4
Level 2 cache	256K
Memory	256MB PC2100 (266MHz) DDR SDRAM
Hard drive	40GB Ultra ATA/100 <sup>4</sup>
Optical drive	Slot-loading Combo drive (DVD-ROM/CD-RW)
Display	12.1-inch (diagonal) TFT XGA
Graphics support	NVIDIA GeForce4 420 Go with 32MB of DDR SDRAM
Wireless support	Built-in Bluetooth 1.1; AirPort Extreme ready <sup>2</sup>
Ethernet	Built-in 10/100BASE-T
Modem	Built-in 56K V.92 <sup>5</sup>
Software	Mac OS X, QuickTime, iCal, iChat, iMovie, iPhoto, iTunes, DVD Player, Mac OS X Mail, Microsoft Internet Explorer, EarthLink (includes 30 days of free service), Acrobat Reader, Art Directors Toolkit, FAXstf, FileMaker Pro Trial, GraphicConverter, Microsoft Office v. X Test Drive, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Developer Tools, Apple Hardware Test
Service and support	90 days of free telephone support and one-year limited warranty
Included	Apple Video Adapter, Apple VGA Display Adapter, modem cable, power adapter, AC wall plug, power cord

## Technical Specifications

Processor and memory

- 867MHz PowerPC G4 processor with Velocity Engine
- 256K DDR SRAM level 2 cache
- 133MHz system bus
- 256MB of PC2100 (266MHz) DDR SDRAM (128MB built in and 128MB in SO-DIMM slot); supports up to 640MB

Storage

- 40GB 4200-rpm Ultra ATA/100 hard drive<sup>4</sup>
- One of the following optical drives:
  - Slot-loading Combo drive (DVD-ROM/CD-RW): reads DVDs at 8x speed, writes CD-R discs at 24x speed, writes CD-RW discs at 10x speed, reads CDs at 24x speed
  - Optional slot-loading SuperDrive (DVD-R/CD-RW): writes DVD-R discs at 1x speed, reads DVDs at 8x speed, writes CD-R discs at 8x speed, writes CD-RW discs at 4x speed, reads CDs at 24x speed

Communications

- Built-in antennas and expansion slot for optional 54-Mbps AirPort Extreme Card<sup>2</sup> (based on 802.11g draft specification; IEEE 802.11b Wi-Fi certified)
- Built-in Bluetooth 1.1
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in 56K V.92 modem<sup>5</sup> (RJ-11 connector)

Expansion

- One FireWire 400 port at up to 400 Mbps<sup>6</sup>
- Two 12-Mbps USB 1.1 ports

Display

- 12.1-inch (diagonal) TFT XGA active-matrix display
  - Support for millions of colors at 1024-by-768-pixel resolution
  - Support for resolution scaling to 800-by-600-pixel and 640-by-480-pixel resolution with millions of colors

Video and graphics support

- NVIDIA GeForce4 420 Go graphics processor with AGP 4X support and 32MB of DDR SDRAM video memory for 2D/3D graphics acceleration
- Dual display and video mirroring: Simultaneously supports up to 1024 by 768 pixels on the built-in display and up to 1600 by 1200 pixels on an external display, both at millions of colors
- VGA output using included Apple VGA Display Adapter
- S-video output using included Apple Video Adapter
- Composite video output using included Apple Video Adapter

Audio

- Audio line in (minijack)
- Headphone out (minijack)
- Built-in stereo speakers with midrange-enhancing third speaker
- Internal omnidirectional microphone

Battery and power

- 47-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 5 hours of battery life<sup>3</sup>
- 45W power adapter with cable management system
- Power adapter port

Security

- Kensington cable lock slot

Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted OTÓ arrangement), and embedded numeric keypad
- Solid-state trackpad for precise cursor control; supports tap, double-tap, and drag capabilities

Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50i to 95i F (10i to 35i C)
- Storage temperature: Ð13i to 140i F (Ð25i to 60i C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

Size and weight

- Height: 1.18 inches (3.0 cm)
- Width: 10.9 inches (27.7 cm)
- Depth: 8.6 inches (21.9 cm)
- Weight: 4.6 pounds (2.1 kg) with battery and optical drive installed<sup>1</sup>

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

1. Actual weight varies by configuration and manufacturing process.  
2. Wireless Internet access requires AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.  
3. Battery life depends on configuration and use.  
4. 1GB = 1 billion bytes; actual formatted capacity less.  
5. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.  
6. Actual rates will vary.

# MacBook (Early 2008 and Late 2008) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height: 1.08 inch (2.75 cm)

Width: 12.78 inches (32.5 cm)

Depth: 8.92 inches (22.7 cm)

Weight: 5.0 pounds (2.27 kg)<sup>1</sup>

## Connections and expansion

- MagSafe power port
- Gigabit Ethernet port
- Mini-DVI port
- FireWire 400 port (up to 400 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)
- Audio line in
- Audio line out
- Kensington cable lock slot

## Communications

Built-in AirPort Extreme Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible

Built-in Bluetooth 2.0 + EDR (Enhanced Data Rate)

Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Built-in omnidirectional microphone
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/audio line out (minijack)

## Installed software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand)

## Environmental status

- Majority of circuit board laminates are free of brominated flame retardants
- Majority of internal cables are PVC-free
- Meets ENERGY STAR requirements

## Display

13.3-inch (diagonal) glossy widescreen TFT display with support for millions of colors

**Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 768, 1024 by 640, 800 by 600, 800 by 500, 720 by 480, and 640 by 480 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

Intel GMA X3100 graphics processor with 144MB of DDR2 SDRAM shared with main memory<sup>3</sup>

Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 1920 by 1200 pixels on an external display, both at millions of colors

Built-in iSight camera

# 5\_MacBook (Early 2008 and Late 2008) - Technical Specifications.pdf

Mini-DVI port

## Pure digital video output

**DVI output** using mini-DVI to DVI adapter (optional)

**VGA output** using mini-DVI to VGA adapter (optional)

**Composite output** using mini-DVI to video adapter (optional)

**S-video output** using mini-DVI to video adapter (optional)

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Solid-state scrolling trackpad for precise cursor control; supports two-finger scrolling, tap, double-tap, and drag capabilities

## Processor and memory

- 2.1GHz or 2.4GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache running 1:1 with processor speed
- 800MHz frontside bus
- 1GB (two 512MB SO-DIMMs) or 2GB (two 1GB SO-DIMMs) of 667MHz DDR2 SDRAM; two SO-DIMM slots support up to 4GB

## Storage

### 2.1GHz MacBook

- 120GB 5400-rpm Serial ATA hard disk drive; optional 160GB or 250GB 5400-rpm drive<sup>4</sup>
- 24x slot-loading Combo drive (DVD-ROM/CD-RW)

Writes CD-R discs at up to 24x speed; writes CD-RW discs at up to 16x speed; reads CDs at up to 24x speed; reads DVDs at up to 8x speed

### 2.4GHz MacBook

- 160GB or 250GB 5400-rpm Serial ATA hard disk drive
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)

Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW

Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, and DVD+RW; 24x CD

## Battery and power<sup>5</sup>

55-watt-hour lithium-polymer battery

60W MagSafe Power Adapter with cable management system

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What’s in the box

- MacBook
- Display cleaning cloth

## 5\_MacBook (Early 2008 and Late 2008) - Technical Specifications.pdf

- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Lithium-polymer battery
- Install/restore DVDs
- Printed and electronic documentation

### Configurations

	2.1GHz MacBook (MB402LL/A)	2.4GHz MacBook (MB403LL/A)	2.4GHz MacBook (MB404LL/A)
Color	White	White	Black
Processor	2.1GHz Intel Core 2 Duo	2.4GHz Intel Core 2 Duo	2.4GHz Intel Core 2 Duo
L2 cache	3MB shared	3MB shared	3MB shared
System bus	800MHz	800MHz	800MHz
Memory	1GB (two 512MB) of 667MHz DDR2 SDRAM (PC2-5300); supports up to 4GB	2GB (two 1GB) of 667MHz DDR2 SDRAM (PC2-5300); supports up to 4GB	2GB (two 1GB) of 667MHz DDR2 SDRAM (PC2-5300); supports up to 4GB
Hard drive <sup>4</sup>	120GB Serial ATA; 5400 rpm	160GB Serial ATA; 5400 rpm	250GB Serial ATA; 5400 rpm
Slot-loading optical drive	Combo drive (DVD-ROM/CD-RW)	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
Graphics	Intel GMA X3100 graphics processor with 144MB of DDR2 SDRAM shared with main memory <sup>3</sup>		
Video	Built-in iSight camera; mini-DVI output port with support for DVI, VGA, S-video, and composite video (requires adapters, sold separately)		
Display	13.3-inch (diagonal) glossy TFT widescreen display, 1280 by 800 resolution		
FireWire	One FireWire 400 port (up to 400 Mbps)		
USB	Two USB 2.0 ports (up to 480 Mbps)		
Audio	Built-in stereo speakers, built-in omnidirectional microphone, combined optical digital audio input/audio line in, combined optical digital audio output/audio line out		
Networking	Built-in 10/100/1000BASE-T (Gigabit) Ethernet		
Wireless	Built-in AirPort Extreme Wi-Fi (based on IEEE 802.11n draft specification) <sup>2</sup> ; built-in Bluetooth 2.0 + EDR (Enhanced Data Rate) module		
Hardware accessories	60W MagSafe Power Adapter, AC wall plug, power cord, lithium-polymer battery		
Limited warranty and service	Your MacBook comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer’s purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.		
Apple and the global environment	Learn more about Apple’s dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.		
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.		

### Options

#### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 500GB or 1TB server-grade hard drive
- Wi-Fi Certified for 802.11n draft 2.0
- USB port for connecting a USB printer or USB external hard drive

#### Configure to order

- 160GB (5400 rpm) hard drive
- 250GB (5400 rpm) hard drive
- Up to 4GB of 667MHz DDR2 SDRAM
- Apple Remote

## 5\_MacBook (Early 2008 and Late 2008) - Technical Specifications.pdf

- Apple USB Modem
- Apple Mini-DVI to DVI Adapter
- Apple Mini-DVI to VGA Adapter
- Aperture 2
- Final Cut Express
- Logic Express
- iWork '08

### Accessories

- AirPort Extreme Base Station
- AirPort Express Base Station
- MagSafe Airline Adapter
- Apple Mini-DVI to Video Adapter
- AppleCare Protection Plan
- .Mac Subscription
- Apple Wireless Keyboard
- Apple wireless Mighty Mouse
- Apple Keyboard
- Apple wired Mighty Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 144MB. An additional 16MB is required when using an external display.
  4. 1GB=1 billion bytes. Actual formatted capacity less.
  5. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information. The wireless productivity test measures battery life by wirelessly browsing various websites and editing text in a word processing document with display brightness set to 50%.

Published Date: Apr 6, 2016



# Logic Pro 7.2 - Technical Specifications

Logic Pro 7.2 - Part Numbers	
Universal Crossgrade	MA336ZM/A
Retail	MA328Z/A
Upgrade from Logic Pro 6 or Logic Platinum/Gold 5 or 6	MA331Z/A
Upgrade from Logic Express 6 or 7	MA332Z/A

## Logic Pro 7 System Requirements

- Macintosh computer with PowerPC G4, PowerPC G5 or Intel Core Duo; Intel Core Duo, PowerPC G5, or dual PowerPC G4 processor recommended.
- Logic Node applications require PowerPC G5 or Intel Core Duo and Gigabit Ethernet connectivity.
- 512MB of RAM.
- Mac OS X v10.4.3 or later for PowerPC-based systems; Mac OS X v10.4.4 or later for Intel-based systems.
- QuickTime 7.0.3 or later.
- 8GB of available hard drive space.
- DVD drive for software installation.
- Available USB port for XSKey (copy protection).
- Low-latency multi-I/O audio hardware and MIDI interface recommended.

## Powerful audio production

- Network-distributed audio processing to expand power for software instruments and effects.
- Track Freeze to extend processing capability for a single computer.
- High-end POW-r dithering algorithm.
- Audio resolution up to 24-bit/192kHz.
- Shuffle and Auto-Crossfade Arrange Edit modes.

## Award-winning instruments and effects

- 34 software instruments, including Sculpture; Ultrabeat; EVP88, EVB3, and EVD6 vintage instruments; and ES1, ES2, EFM1, ESM, ESP and ESE synthesizers.
- EXS24 mk II sampler with comprehensive sampler instrument library.
- Over 70 effect plug-ins, including Guitar Amp Pro, Ringshifter, Linear Phase EQ, Match EQ, Vocal Transformer, EVOC20 Vocoder, Space Designer convolution reverb and Pitch Correction.

## Professional mixing and automation

- Adaptive Track Mixer for display of selected channels.
- Save/Load Channel Strip instrument and plug-in configurations.
- Sample-accurate, track-based 32-bit automations.
- Extensive Channel group functions for mix and edit.
- Up to 255 stereo tracks.
- 64 buses, 64 auxiliary channels.
- 15 inserts, 8 sends per channel.
- Support for multiple surround formats, including 5.1 and 7.1.
- Comprehensive hardware controller support.

## Advanced MIDI sequencing

- Matrix, Event List, Hyper, Score and Transform MIDI edit windows.
- Layout and printing of complete professional scores.
- Caps Lock conversion of computer keys into musical keyboard.

## Comprehensive control

# 600\_Logic Pro 7.2 - Technical Specifications.pdf

- More than 800 definable key and MIDI commands.
- 90 recallable screen configurations with interactive edit windows.
- Project Manager for powerful control of assets.
- Setup Assistant for easy system configuration.
- Fast, offline bouncing of single or multiple tracks.
- Tempo, Signature, Chord, Transpose, Beat-Mapping and Video Tracks.

Published Date: Oct 15, 2010

# Logic Express 7.2 - Technical Specifications

Logic Express 7.2 - Part Numbers	
Retail	MA338Z/A
Upgrade	MA344Z/A
Universal Crossgrade	MA343ZM/A

## Logic Express 7.2 System Requirements

- Macintosh computer with PowerPC G4, PowerPC G5 or Intel Core Duo; Intel Core Duo, PowerPC G5, or dual PowerPC G4 processor recommended.
- 512MB of RAM.
- Mac OS X v10.4.3 or later for PowerPC-based systems; Mac OS X v10.4.4 or later for Intel-based systems.
- QuickTime 7.0.3 or later.
- 6GB of available hard drive space.
- DVD drive for software installation.
- Low-latency multi-I/O audio hardware and MIDI interface recommended.

## Technical Specifications

- Feature Comparison.
- Technical Specifications.
- Resources.

## Professional quality audio production

- Track Freeze to extend processing capability for a single computer.
- High-end POW-r dithering algorithm
- Audio resolution up to 24-bit/96kHz
- Overlap and No Overlap, Arrange Edit modes.
- Support for up to 12 input and output audio channels.

## Award-winning instruments and effects

- 27 software instruments, including GarageBand Instruments, ES1, EFM1, ESM, ESP and ESE synthesizers.
- EXSP24 mk II sampler with comprehensive sampler instrument library.
- 40 effect plug-ins, including Guitar Amp, Preset Multipressor, PlatinumVerb, Compressor, Bitcrusher, AutoFilter, Phaser and more.

## Professional mixing and automation

- Adaptive Track Mixer for display of selected channels.
- Save/Load Channel Strip instrument and plug-in configurations.
- Sample-accurate, track-based 32-bit automation.
- Extensive Channel group functions (Volume and Mute).
- Up to 255 stereo tracks.
- 64 software instrument tracks.
- 8 buses, 8 auxiliary channels.
- 4 inserts, 8 sends per channel.
- Expansive hardware controller support.

## Advanced MIDI sequencing

- Matrix, Event List, Hyper, Score and Transform MIDI edit windows.
- Layout and printing of complete professional scores.
- Caps Lock conversion of computer keys into musical keyboard.

## Comprehensive control

# 601\_Logic Express 7.2 - Technical Specifications.pdf

- More than 300 definable key and MIDI commands.
- 90 recallable screen configurations with interactive edit windows.
- Setup Assistant for easy system configuration.
- Fast, offline bouncing of single or multiple tracks.
- Tempo, Signature, Transpose and Video Tracks.

## **Extensive compatibility**

- Support for Apple Loops (more than 1,000 Apple Loops included).
- Audio Units plug-in support.
- GarageBand song file import.
- Open TL file import.
- AAC and MP3 import and export.
- Full integration with Reason, Live and other Rewire-compatible applications.
- Optimized for PowerPC G4 and G5 processors.

Published Date: Oct 15, 2010

# Final Cut Express 1 - Technical Specifications

Final Cut Express 1 - Part Number	
Retail	M8987Z/A

## Final Cut Express 1 System requirements

- Macintosh computer with a 300-MHz or faster PowerPC G3 or G4 processor and built-in FireWire.
- A 500-MHz or faster single or 450-MHz dualprocessor Power Mac G4 or PowerBook G4 is required for G4 real-time effects.
- A 667-MHz PowerBook G4 is required for mobile G4 real-time effects.
- Mac OS X v10.2 or later.
- QuickTime 6.0.2 or later.
- 256MB of RAM (384MB recommended for G4 real-time effects).
- 40MB of available disk space required for installation.

## Input/Capturing Video

- Plug-and-play support for most DV25-format camcorders and decks: MiniDV and DVCAM (NTSC or PAL).
- Works effortlessly with most FireWire-enabled MiniDV camcorders from leading manufacturers like Sony, Canon, Panasonic, and JVC.

## Output

- Print to Video command lets you send a sequence or clip to videotape for recording.
- Projects can be recorded on your DV camcorder.
- Footage can be looped if you want to output your program multiple times on the same tape.
- Import your completed project in iDVD or DVD Studio Pro to create a DVD.
- Add chapter markers with or without comments and durations to jump to specified content.
- Projects can be exported using a wide range of codecs, including MPEG-4, for distribution via email or the web.

## Editing Tools

- Unique mode-free interface lets you move seamlessly between editing, trimming, compositing and effects, and audio functions in the Viewer, Canvas, Browser, and Timeline.
- Three-point editing model uses three edit points to define where a new clip should be added to your sequence. Final Cut Express calculates the fourth point.
- Editing commands are available from multiple points in the interface.
- Sync detection and correction compensates for audio and video tracks that slip out of sync.
- Edits to clips reference the original video so the source footage is never altered.
- Multiple editing actions, including insert, overwrite, and replace, give you control over how clips are added to the timeline.
- Extend and split trimming edit functions include slip-and-slide, ripple, and roll tools.
- Active track targeting lets you specify individual or multiple tracks to apply edits to, or to protect from being edited.
- The Autosave Vault saves your project at specified intervals so you can return to any point in your edit without losing your work.

## Transitions, Filters and Effects

- Final Cut Express includes over 200 transitions, filters, and effects.
- Precision controls are available simply by clicking a tab in the Viewer window.
- Real-time effects deliver select transitions, titles, and composites without rendering on Mac systems equipped with G4 processors.
- Make sure flesh tones and other key elements are accurate.
- Mix colors to achieve a visual style.
- Match footage from different sources for consistency.
- Correct errors in color balance and exposure.

## Compositing

- Use nesting to build virtually unlimited compositing layers for complex video effects.
- Import Adobe Photoshop files complete with layers to create effects and motion graphics.
- Use Bezier curves with movable motion paths, graphs, and numerical controls to apply and control animations.
- Smooth compositing animations with ease in/ease out motion paths.

# 602\_Final Cut Express 1 - Technical Specifications.pdf

- Use time effects, including slow motion with frame blending, to create smooth time-altered playback.
- With accurate subpixel interpolation rendering, effects placed on a clip are applied smoothly to produce a high-quality result.
- Apply effects to time ranges, not just clips, for full control over the look of a sequence.
- Use Photoshop-like transfer modes such as multiply and lighten.
- Use the flicker filter to incorporate still frames from video.

## Titling

- Boris Calligraphy plug-ins help you create 3D titles.
- Precision controls are available simply by clicking a tab.
- Use the titling tools to create a range of title styles to fit your project.
- Use the Final Cut Express standard and scrolling text generators to create titles that crawl, scroll, or appear in the lower third of the screen.
- Combine titles with other filters, effects, and compositing for unlimited creative expression.

## Audio

- Final Cut Express lets you include up to 99 total audio tracks with up to 8 tracks of audio playback in real time.
- More than 12 audio filters, including three-band and parameter equalizer, compressor/limiter, 60/120-Hz hum remover, and noise gate give you control over the quality of your soundtrack.
- Built-in audio filters include reverb, EQ, echo, and noise gate.
- Subframe audio editing to 1/100th of a frame gives you precise control over audio edits.
- Audio level meters allow you to achieve the dynamic range you want.
- Audio pan controls let you control stereo channel playback.
- Sampling at 8 to 48 kHz and 8 to 16 bits enables you to match the recorded source material sample rate and control audio quality.
- Record a voice-over track directly to the timeline.
- Voice-over can be recorded while video is playing back for perfect timing.

## Range

- Capture window lets you name, add comments, and organize your captured clips as you import them.
- Support for multiple sequences in projects allows you to create alternative edits or break projects up into smaller pieces.
- Sequences can be nested and remain fully editable.
- They can also be reused in multiple timelines.
- Asset management is made easier with bins that allow you to organize your files and sequences in a project.

Published Date: Oct 15, 2010

# Final Cut Express 3 - Technical Specifications

Final Cut Express 3 - Part Numbers	
Retail	M9732Z/A
Upgrade	M9735Z/A

## Final Cut Express 3 System Requirements

- Macintosh computer with a 500MHz or faster PowerPC G4 or G5 processor (550MHz for PowerBook G4 or iBook G4, 450MHz for dual PowerPC G4 or G5) and an AGP (Accelerated Graphics Port) graphics card compatible with Quartz Extreme.
- Mac OS X 10.3.7 or later.
- QuickTime 6.5.2 or later.
- 384MB of RAM (512MB required for RT Extreme and Soundtrack).

## HDV

- 1GHz or faster PowerPC G4 or G5 processor.
- 1GB of RAM.
- All above OS, QuickTime and graphics card requirements.

## Installation

- 1GB of available disk space for application installation.
- 5GB of available disk space for Soundtrack content.
- 9GB of available disk space for LiveType content.
- DVD drive for software installation.

## Audio

- Up to 99 total audio tracks per sequence.
- More than 25 audio filters, including three-band and parameter equalizer, compressor/limiter, 60/120-Hz hum remover and noise gate for soundtrack quality control.
- Real-time fader automation.
- Variable keyframe thinning.
- Real-time audio filters and effects.
- Real-time audio filter adjustments during playback.
- Subframe audio keyframing to 1/100th of a frame.
- Sampling at 8kHz to 48kHz and 8 to 24 bits.
- Audio level meters (per track).
- Mac OS X Audio Units plug-in support.
- Pan controls.
- Mute and solo controls.
- Audio waveform display in Timeline.
- Logarithmic audio fades.
- Scrubbing with or without pitch shifting.
- Voice Over tool for adding narration directly to Timeline.
- Audio level overlays viewable in the Timeline.
- Isolation of audio tracks with solo and mute controls.
- No re-rendering required when muted tracks are reactivated.

## Soundtrack

- Custom music creation.
- Final Cut Express HD video with scoring markers import.
- 4,000 royalty-free loops and sound effects.
- Audio effects plug-ins.
- Powerful search engine.
- Combined loop key and tempo matching.
- Real-time scoring.

# 603\_Final Cut Express 3 - Technical Specifications.pdf

- Support for AIFF, WAV and Acid formats.
- Professional audio effects.
- Mac OS X Audio Units plug-in support.
- Fully automated mixing and effects.

## Input/Capturing Video

- Plug-and-play support for most DV25-format camcorders and decks: MiniDV and DVCAM (NTSC or PAL).
- Plug-and-play support for most HDV-format camcorders and decks: 720p, 1080i.
- FireWire device control of most FireWire-enabled MiniDV and HDV camcorders from leading manufacturers such as Sony, Canon, Panasonic and JVC.
- Capture window for naming, adding comments to and organizing clips as they are captured.
- Incremental clip naming during capture when a recording break is discovered.
- Still image importing for PSD, BMP, JPEG, PICT, PNG, SGI, TARGA and TIFF formats.
- iMovie file import with effects, transitions and audio levels.
- Bins for project file and sequence organization.
- Clip organization in the Browser using the extensive search, sort and sift capabilities.
- Clip labels for organizing and sorting clips.
- Extensive search, sort, sift capabilities in Browser.
- Master and affiliate clip relationship for automatic update of certain properties of a clip, such as clip name or reel name, within the current project.
- Up to 32 levels of undo.

## Editing and Timeline

- Non-destructive editing references original video to prevent alteration of source footage.
- Editing palette for most-used functions, enabling one-click, pro-style edits.
- Drag-and-drop editing.
- Editing on the Timeline.
- Three-point editing model.
- 99 video tracks with support for nesting sequences together.
- Support for multiple sequences and projects for creating alternative edits or breaking projects into smaller pieces.
- Insert and overwrite with or without transitions.
- Replace, fit to fill and superimpose edits.
- Edit overly for insert, overwrite, replace, fit to fill and superimpose for control over how clips are added to the Timeline.
- Blade and Blade All tools for adding edit points to sequences.
- Extend and split edits for additional editing options.
- Sync detection and correction to compensate for audio and video tracks that slip out of sync.
- Active track targeting for specifying individual or multiple tracks to apply edits or protect from editing.
- Auto Select controls of specific tracks in the Timeline for track content selection via In and Out points in the Timeline or Canvas.
- Adjacent (through edit) indicators in Timeline.
- Dupe detection in Timeline.
- Keyframe graphs.
- Track locking.
- Timecode or frames in Timeline.
- Clip, sequence, scoring, chapter and compression markers.
- Clip and sequence marker export to LiveType for titling.
- Clip and scoring marker export for Soundtrack.
- Chapter marker export for iDVD and DVD Studio Pro.
- Custom, independent track heights.
- Autosave Vault for saving projects at specified intervals to prevent accidental loss.

## Trimming

- Ripple, roll, slip and slide.
- Asymmetric, multitrack trimming.
- Dynamic JKL trimming.
- Trim Edit window.
- Timeline trimming.
- Keyboard and numeric trimming.

## Output



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- Print to Video command for recording a sequence or clip back to DV or HDV device.
- Footage looping for multiple outputs on the same tape.
- Sequence, scoring, chapter and compression markers.
- Marker exports to DVD Studio Pro for chapter and compression settings.
- Scoring marker export to Soundtrack.
- Projects export using any QuickTime file format, including MPEG-4, for distribution via email or the web.
- Digital Cinema Desktop for full-screen, real-time preview playback.

## Media Management

- Extensive search, sort, sift capabilities in Browser.
- Clip labels.
- Custom comment fields.
- Master and affiliate clips.
- Move, copy and transcode capability at sequence or project level.
- Autosave Vault.

## Transitions, Filters and Effects

- More than 200 transitions, filters and effects.
- Unlimited effects favorites.
- Copy and paste capability for motion and effect attributes.
- Bezier curves for motion paths.
- Keyframe capabilities for precise animation.
- Precision numeric controls for effects and animation.
- RT Extreme for scalable, software-based, multistream real-time effects.
- Safe and Unlimited RT Extreme modes for customizing performance versus quality tradeoffs.
- RT Extreme quality settings: low, medium, high. Low setting for maximum simultaneous real-time streams and effects; high setting for full-resolution output for finishing directly to DV or HDV device.
- Opacity overlays in Timeline for adjustable, keyframeable opacity.
- Direct-to-Timeline drag-and-drop Motion project integration.
- Auto Render option.
- Broadcast safe filter.
- 2D and 3D titles with Boris Calligraphy.
- Composite and transfer modes.

## Titling

- Standard and scrolling text generators for creating titles that crawl, scroll or appear in the lower third of the screen.
- Option to combine titles with other filters, effects and compositing for unlimited creative expression.
- Boris Calligraphy plug-ins for 2D and 3D titles.
- Non-Latin alphabet characters and symbols with full Unicode support.

## LiveType

- Animated title and motion graphics creation.
- Unicode system font support.
- 9 GB of royalty-free animated content including 27 LiveFonts and hundreds of background textures and objects.
- Sophisticated project templates.
- 150 customizable effects.
- Keyframe animation.
- Real-time wireframe preview.
- Canvas RAM preview.
- Import capability for a wide variety of formats.
- Independent and scalable resolution.
- Dynamic individual character control.
- Animation for rolls and crawls.
- Type on a curve capability.
- FontMaker utility for creating custom LiveFonts.
- Drag-and-drop integration to Final Cut Express HD Timeline with auto-updating.

## **Compositing**

- Nesting for virtually unlimited compositing layers for complex video effects.
- Adobe Photoshop file import, complete with layers for effects and motion graphics.
- Bezier curves with movable motion paths for animation application and control.
- Ease in/ease out motion paths for smooth compositing animations.
- Time effects, including slow motion with frame blending, for smooth, time-altered playback.
- Accurate subpixel interpolation rendering for smooth, high-quality effects creation.
- Transfer modes including multiply and lighten.
- Flicker filter for incorporation of still frames from video.

## **Color Correction**

- Secondary (two-way) color corrector.
- Image control filters.
- Broadcast-safe filter.
- Correction for flesh tones and other key elements.
- Color mixing for visual style.
- Footage matching from different sources for consistency.
- Error correction in color balance and exposure.

## **Streamlined Workflow**

- Full Unicode support.
- Dynamic window resizing.
- Mode-free interface for workflow efficiency.
- Simultaneous opening of multiple sequences and projects.
- 99 audio and 99 video tracks with support for nesting sequences together.
- System and user preferences.
- Easy Setups for quick configuration.
- Customizable real-time effects settings.
- Customizable render settings.
- Customizable window arrangements.
- Customizable user interface buttons.
- Customizable Browser layouts.
- Customizable track layouts.
- Custom, independent track heights in the Timeline.

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# Final Cut Express 3.5

Final Cut Express 3.5 - Part Number	
Retail	MA261Z/A

## Final Cut Express 3.5 System Requirements

- Macintosh computer with 500MHz or faster PowerPC G4 or G5 (550MHz for PowerBook G4) or Intel Core Duo.
- 512MB RAM.
- Display with 1024-by-768 (or higher) resolution.
- An AGP or PCI Express graphics card compatible with Quartz Extreme or an Intel GMA integrated graphics processor in MacBook or Mac mini.
- Mac OS X 10.4.6 or later.
- QuickTime 7.0.4 or later.
- HDV features require 1GHz or faster processor and 1GB of RAM (2GB recommended).
- 500MB disk space required for applications; additional 16GB of additional storage space for Soundtrack and LiveType content (can be installed on separate disks).
- DVD drive for software installation.

## Universal Application

- Final Cut Express HD 3.5, LiveType 2, and Soundtrack 1.5 are all Universal applications, optimized for Macs with Intel Core Duo processors.

## Input/Capturing Video

- Plug-and-play support for most DV25-format camcorders and decks: MiniDV and DVCAM (NTSC or PAL).
- Plug-and-play support for most HDV-format camcorders and decks: 720p, 1080i.
- FireWire device control of most FireWire-enabled MiniDV and HDV camcorders from leading manufacturers such as Sony, Canon, Panasonic, and JVC.
- Capture window for naming, adding comments to and organizing clips as they are captured.
- Incremental clip naming during capture when a recording break is discovered.
- Still image importing for PSD, BMP, JPEG, PICT, PNG, SGI, TARGA, and TIFF formats.
- iMovie file import with effects, transitions, and audio levels.
- Bins for project file and sequence organization.
- Clip organization in the Browser using the extensive search, sort, and sift capabilities.
- Clip labels for organizing and sorting clips.
- Extensive search, sort, sift capabilities in Browser.
- Master and affiliate clip relationship for automatic update of certain properties of a clip, such as clip name or reel name, within the current project.
- Up to 32 levels of undo.

## Editing and Timeline

- Non-destructive editing references original video to prevent alteration of source footage.
- Editing palette for most-used functions, enabling one-click, pro-style edits.
- Drag-and-drop editing.
- Editing on the Timeline.
- Three-point editing model.
- 99 video tracks with support for nesting sequences together.
- Support for multiple sequences and projects for creating alternative edits or breaking projects into smaller pieces.
- Insert and overwrite with or without transitions.
- Replace, fit to fill and superimpose edits.
- Edit overly for insert, overwrite, replace, fit to fill. and superimpose for control over how clips are added to the Timeline.
- Blade and Blade All tools for adding edit points to sequences.
- Extend and split edits for additional editing options.
- Sync detection and correction to compensate for audio and video tracks that slip out of sync.
- Active track targeting for specifying individual or multiple tracks to apply edits or protect from editing.
- Auto Select controls of specific tracks in the Timeline for track content selection via In and Out points in the Timeline or Canvas.
- Keyframe graphs.
- Track locking.

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- Timecode or frames in Timeline.
- Clip, sequence, scoring, chapter, and compression markers.
- Clip and sequence marker export to LiveType for titling.
- Clip and scoring marker export for Soundtrack.
- Chapter marker export for iDVD and DVD Studio Pro.
- Custom, independent track heights.
- Autosave Vault for saving projects at specified intervals to prevent accidental loss.

## Trimming

- Ripple, roll, slip and slide.
- Asymmetric, multitrack trimming.
- Dynamic JKL trimming.
- Trim Edit window.
- Timeline trimming.
- Keyboard and numeric trimming.

## Output

- Print to Video command for recording a sequence or clip back to DV or HDV device.
- Footage looping for multiple outputs on the same tape.
- Sequence, scoring, chapter, and compression markers.
- Marker exports to DVD Studio Pro for chapter and compression settings.
- Scoring marker export to Soundtrack.
- Projects export using any QuickTime file format, including MPEG-4, for distribution via email or the Web.
- Digital Cinema Desktop for full-screen, real-time preview playback.

## Media Management

- Extensive search, sort, sift capabilities in Browser.
- Clip labels.
- Custom comment fields.
- Master and affiliate clips.
- Move, copy, and transcode capability at sequence or project level.
- Autosave Vault.

## Transitions, Filters and Effects

- More than 200 transitions, filters and effects.
- Unlimited effects favorites.
- Copy and paste capability for motion and effect attributes.
- Bezier curves for motion paths.
- Keyframe control of all effects and filters for precise results.
- Precision numeric controls for effects and animation.
- RT Extreme for scalable, software-based, multistream real-time effects.
- Safe and Unlimited RT Extreme modes for customizing performance versus quality tradeoffs.
- RT Extreme quality settings: low, medium, high. Low setting for maximum simultaneous real-time streams and effects; high setting for full-resolution output for finishing directly to DV or HDV device.
- Dynamic RT for automatic adjustment of image quality and frame rate on the fly, optimizing playback, and scaling performance as CPU power increases.
- Opacity overlays in Timeline for adjustable, keyframeable opacity.
- Direct-to-Timeline drag-and-drop Motion project integration.
- Auto Render option.
- Broadcast safe filter.
- 2D and 3D titles with Boris Calligraphy.
- Composite and transfer modes.

## Titling

- Standard and scrolling text generators for creating titles that crawl, scroll, or appear in the lower third of the screen.
- Option to combine titles with other filters, effects, and compositing for unlimited creative expression.
- Boris Calligraphy plug-ins for 2D and 3D titles.

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- Non-Latin alphabet characters and symbols with full Unicode support.

## LiveType 2

- Animated title and motion graphics creation.
- Unicode system font support.
- More than 10GB of royalty-free animated content, including 36 LiveFonts and hundreds of background textures and objects.
- Sophisticated project templates, including templates for HDV.
- More than 200 customizable effects.
- Keyframe animation.
- Real-time wireframe preview.
- Canvas RAM preview.
- Import capability for a wide variety of formats.
- Independent and scalable resolution.
- Dynamic individual character control.
- Animation for rolls and crawls.
- Type on a curve capability.
- FontMaker utility for creating custom LiveFonts.
- Drag-and-drop integration to Final Cut Express HD Timeline with auto-updating.

## Compositing

- Nesting for virtually unlimited compositing layers for complex video effects.
- Adobe Photoshop file import, complete with layers for effects and motion graphics.
- Bezier curves with movable motion paths for animation application and control.
- Ease in/ease out motion paths for smooth compositing animations.
- Time effects, including slow motion with frame blending, for smooth, time-altered playback.
- Accurate subpixel interpolation rendering for smooth, high-quality effects creation.
- Transfer modes including multiply and lighten.
- Flicker filter for incorporation of still frames from video.

## Color Correction

- Secondary (two-way) color corrector.
- Image control filters.
- Broadcast-safe filter.
- Correction for flesh tones and other key elements.
- Color mixing for visual style.
- Footage matching from different sources for consistency.
- Error correction in color balance and exposure.

## Streamlined Workflow

- Full Unicode support.
- Dynamic window resizing.
- Mode-free interface for workflow efficiency.
- Simultaneous opening of multiple sequences and projects.
- 99 audio and 99 video tracks with support for nesting tracks together.
- System and user preferences.
- Easy Setups for quick configuration.
- Customizable real-time effects settings.
- Customizable render settings.
- Customizable window arrangements.
- Customizable user interface buttons.
- Customizable Browser layouts..
- Customizable track layouts.
- Custom, independent track heights in the Timeline.

## Audio

- Up to 99 total audio tracks per sequence.
- More than 25 audio filters, including three-band and parameter equalizer, compressor/limiter, 60/120-Hz hum remover and noise gate for

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soundtrack quality control.

- Real-time fader automation.
- Variable keyframe thinning.
- Real-time audio filters and effects.
- Real-time audio filter adjustments during playback.
- Subframe audio keyframing to 1/100th of a frame.
- Sampling at 8kHz to 48kHz and 8 to 24 bits.
- Audio level meters (per track).
- Mac OS X Audio Units plug-in support.
- Pan controls.
- Mute and solo controls.
- Audio waveform display in Timeline.
- Logarithmic audio fades.
- Scrubbing with or without pitch shifting.
- Voiceover tool for adding narration directly to Timeline.
- Audio level overlays viewable in the Timeline.
- Isolation of audio tracks with solo and mute controls.
- No re-rendering required when muted tracks are reactivated.

## Soundtrack 1.5

- Custom music creation.
- Final Cut Express HD video with scoring markers import.
- 4,000 royalty-free loops and sound effects.
- Audio effects plug-ins.
- Powerful search engine.
- Combined loop key and tempo matching.
- Real-time scoring.
- Support for AIFF, MP3, WAV, and ACID formats.
- Works with GarageBand JamPacks.
- Professional audio effects.
- Mac OS X Audio Units plug-in support.
- Fully automated mixing and effects.

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# Logic Express 7 - Technical Specifications

Logic Express 7 - Part Numbers	
Retail	<b>M9670Z/A</b>
Logic Express 7 Upgrade from Logic Express 6	<b>M9707Z/A</b>

## Logic Express 7 System Requirements

- Macintosh computer with a PowerPC G4 or faster processor (G5 or dual G4 processors recommended).
- 512MB of RAM.
- Mac OS X v10.3 or later.
- 4GB of available hard disk space.
- DVD drive for software installation.
- Low-latency multi-I/O audio hardware and MIDI interface recommended.
- Separate hard drive recommended for high-resolution audio tracks.

## Technical Specifications

- Feature Comparison.
- Technical Specifications.
- Resellers.
- Resources.

## Professional quality audio production

- Track Freeze to extend processing capability for a single computer.
- High-end POW-r dithering algorithm.
- Audio resolution up to 24-bit/96kHz.
- Overlap and No Overlap, Arrange Edit modes.
- Support for up to 12 input and output audio channels.

## Award-winning instruments and effects

- 27 software instruments, including GarageBand Instruments, ES1, EFM1, ESM, ESP and ESE synthesizers.
- EXSP24 mk II sampler with comprehensive sampler instrument library.
- 40 effect plug-ins, including Guitar Amp, Preset Multipressor, PlatinumVerb, Compressor, Bitcrusher, AutoFilter, Phaser and more.

## Professional mixing and automation

- Adaptive Track Mixer for display of selected channels.
- Save/Load Channel Strip instrument and plug-in configurations.
- Sample-accurate, track-based 32-bit automation.
- Extensive Channel group functions (Volume and Mute).
- Up to 255 stereo tracks.
- 64 software instrument tracks.
- 8 buses, 8 auxiliary channels.
- 4 inserts, 8 sends per channel.
- Expansive hardware controller support.

## Advanced MIDI sequencing

- Matrix, Event List, Hyper, Score and Transform MIDI edit windows.
- Layout and printing of complete professional scores.
- Caps Lock conversion of computer keys into musical keyboard.

## Comprehensive control

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- More than 300 definable key and MIDI commands.
- 90 recallable screen configurations with interactive edit windows.
- Setup Assistant for easy system configuration.
- Fast, offline bouncing of single or multiple tracks.
- Tempo, Signature, Transpose and Video Tracks.

## **Extensive compatibility**

- Support for Apple Loops (more than 1,000 Apple Loops included).
- Audio Units plug-in support.
- GarageBand song file import.
- Open TL file import.
- AAC and MP3 import and export.
- Full integration with Reason, Live and other Rewire-compatible applications.
- Optimized for PowerPC G4 and G5 processors.

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# Final Cut Express 2 - Technical Specifications

## Final Cut Express 2 System Requirements

- Macintosh computer with a 350MHz PowerPC G4 or G5 processor and AGP graphics card.
- RT Extreme requires a 500MHz PowerPC G4 (550MHz for PowerBook G4) or G5 processor or any dual PowerPC G4 or G5 processors.
- Mac OS X v10.2.5 or later.
- QuickTime 6.4 or later.
- 384MB of RAM (512MB required for RT Extreme).
- 40MB of available disk space required for installation.

## Input/Capturing Video

- Plug-and-play support for most DV25-format camcorders and decks: MiniDV and DVCAM (NTSC or PAL).
- FireWire device control of most FireWire-enabled MiniDV camcorders from leading manufacturers, like Sony, Canon, Panasonic and JVC.
- Ignores timecode breaks and incrementally names clips automatically when a recording break is discovered.
- Capture window lets you name, add comments to and organize your clips as you capture them.
- Imports a range of still image formats: PSD, BMP, JPEG, PICT, PNG, SGI, TARGA, TIFF.
- Asset management is made easier with bins that allow you to organize your files and sequences in a project.
- Support for multiple sequences in projects allows you to create alternative edits or break projects up into smaller pieces.
- Sequences can be nested and remain fully editable. They can also be reused in multiple timelines.
- 99 audio and 99 video tracks, with support for nesting sequences together.
- Extensive search, sort, sift capabilities in Browser.
- Clip labels help organize and sort clips.
- Master and affiliate clip relationship automatically updates properties of a clip, such as Clip Name or Reel Name, within the current project.
- Work with multiple sequences and open multiple projects simultaneously.
- Up to 32 levels of undo.

## Output

- Print to Video command lets you send a sequence or clip to videotape for recording.
- Projects can be recorded on your DV camcorder.
- Footage can be looped if you want to output your program multiple times on the same tape.
- Import your completed project in iDVD or DVD Studio Pro to create a DVD.
- Add chapter markers with or without comments and durations to jump to specified content.
- Clip, sequence, scoring, chapter and compression markers.
- Marker exports to DVD Studio Pro for chapter and compression settings.
- Scoring marker export to Soundtrack.
- Projects can be exported using any QuickTime file format or the web.

## Editing Tools

- Edits to clips reference the original video so the source footage is never altered.
- Editing palette contains most-used functions, so pro-style edits are just a click away.
- Edit overlay for drag-and-drop editing.
- Multiple editing actions, including insert, overwrite, replace, fit to fill and superimpose, give you control over how clips are added to the timeline.
- Insert and overwrite with or without transitions.
- Blade and Blade All tools for adding edit points to your sequence.
- Extend and split edits provide additional editing options.
- Sync detection and correction compensate for audio and video tracks that slip out of sync.
- Active track targeting lets you specify individual or multiple tracks to apply edits to, or to protect from being edited.
- Enabling the Auto Select controls of specific tracks in the Timeline allows the contents of those tracks to be selected via In and Out points in the Timeline or Canvas.
- Trimming edit functions include slip, slide, ripple and roll tools.
- Asymmetric, multitrack trimming.
- Dynamic JKL trimming.
- Trim window.
- Timeline trimming.
- Keyboard and numeric trimming.
- The Autosave Vault saves your project at intervals so you can return to any point in your edit without losing your work.

## Transitions, Filters and Effects

- Includes over 200 transitions, filters and effects.
- Unlimited effects favorites.
- Copy and paste motion and effect attributes.
- Unlimited layers with support for nesting.
- Bezier curves with movable motion paths.
- Keyframe capabilities for precise animation.
- Precision numeric controls for effects and animation.
- RT Extreme gives users dramatically more real-time effects, transitions and video layers (up to 8 DV streams).
- Low, medium and high RT Extreme quality settings provide a range of maximum simultaneous real-time streams, effects and resolution options.
- Safe and unlimited RT Extreme modes let you customize performance versus quality tradeoffs.
- Opacity overlays in Timeline let you adjust and keyframe opacity.
- Two-way color corrector.
- YUV.
- Image control filters.
- Make sure flesh tones and other key elements are accurate.
- Mix colors to achieve a visual style.
- Match footage from different sources for consistency.
- Correct errors in color balance and exposure.

## Titling

- Use standard and scrolling text generators to create titles that crawl, scroll or appear in the lower third of the screen.
- Combine titles with other filters, effects and compositing for unlimited creative expression.
- Boris Calligraphy plug-ins help you create 2D and 3D titles.
- Precision controls are available simply by clicking a tab.
- Use the titling tools to create a range of title styles to fit your project.
- Full Unicode support.

## Audio

- Include up to 99 total audio tracks with up to 8 tracks of audio playback in real time.
- More than 25 audio filters, including three-band and parameter equalizer, compressor/limiter, 60/120-Hz hum remover and noise gate give you control over the quality of your soundtrack.
- Other built-in audio filters include reverb and echo.
- Audio Unit support, including a set of Audio Unit filters you can use to adjust your audio clips. (Audio Unit format is the standard Apple audio plug-in format for Mac OS X applications).
- Automated audio keyframe recording.
- Subframe audio editing to 1/100th of a frame gives you precise control over audio edits.
- Audio level meters allow you to achieve the dynamic range you want.
- Audio pan controls let you control stereo channel playback.
- Sampling at 8 to 48 kHz and 8 to 16 bits enables you to match the recorded source material sample rate and control audio quality.
- Waveform display in Timeline.
- Audio level overlays in Timeline.
- Adjust the volume of any track while listening to playback to make better, more accurate decisions about audio levels.
- Audio tracks can be isolated with solo and mute controls. No re-rendering is required when muted tracks are reactivated.
- Audio filters can be adjusted in real time as the track is playing for immediate feedback on any of the filter parameters.
- Record a voiceover track directly to the timeline.
- Voiceover can be recorded while video is playing back for perfect timing.

## Streamlined Workflow

- Unique mode-free interface lets you move seamlessly between editing, trimming, compositing, effects and audio functions in the Viewer.
- Updated UI is more elegant, cleaner and exposes more controls.
- Mode-free interface for workflow efficiency.
- System and user preferences.
- Easy setups for quick configuration.
- Customizable RT effects settings (Safe and Unlimited High, Medium and Low).
- Customizable render settings.
- Dynamic window resizing and customizable window arrangements.

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- Customizable Button Bar lets you create shortcuts to favorite functions, saving time and letting you tailor workspace to fit your habits.
- Customizable user interface buttons.
- Customizable Browser layouts.
- Customizable track layouts and custom, independent track heights.

## Compositing

- Use nesting to build virtually unlimited compositing layers for complex video effects.
- Import Adobe Photoshop files complete with layers to create effects and motion graphics.
- Use Bezier curves with movable motion paths, graphs and numerical controls to apply and control animations.
- Smooth compositing animations with ease in/ease out motion paths.
- Use time effects, including slow motion with frame blending, to create smooth time-altered playback.
- With accurate subpixel interpolation rendering, effects placed on a clip are applied smoothly to produce a high-quality result.
- Apply effects to time ranges, not just clips, for full control over the look of a sequence.
- Use transfer modes such as multiply and lighten.
- Use the flicker filter to incorporate still frames from video.

Published Date: Oct 15, 2010

# Final Cut Pro 2 - Technical Specifications

Final Cut Pro 2 - Part Numbers	
Upgrade	M8276Z/A

## Final Cut Pro 2 System Requirements

- Macintosh computer with a 300MHz or faster Blue & White G3 or G4 processor (Beige G3s are not supported).
- Mac OS 9.1 or later (9.1 Updater included — Final Cut Pro 2 is not certified to run in Mac OS X or in Classic-mode\*\*).
- QuickTime 5.0 or later (included).
- available memory of 105MB.
- CD-ROM or DVD-ROM drive.
- 20MB of available disk space required for installation (one or more high-performance SCSI media drives recommended).

## Video Editing Systems\*

- Aurora Video Systems Igniter Studio.
- (8-bit).
- Digital Voodoo D1 Desktop 64AV.
- (8-bit).
- Pinnacle Systems Targa CinéWave.
- (8-bit).
- Digital Voodoo D1 Desktop 64A V.
- (10-bit).
- Matrox RTMac.

## Final Cut Pro 2 Device Qualification

- The Final Cut Pro qualification team performs extensive in-house tests to determine whether or not the latest devices work with current Apple hardware and software. See the current list of devices qualified with Final Cut Pro 2.

## Input and output formats

- DV video using FireWire.
- Composite and component NTSC and PAL analog using Final Cut Pro 2-qualified cards.\*
- QuickTime video and file formats, including Motion and Photo JPEG, Sorenson, Cinepak, and more.
- Standard image formats (BMP, JPEG, MacPaint, Photoshop, PICT, PNG, QuickTime Image, SGI, TARGA, TIFF) with alpha channels maintained (import only).
- Standard sound formats, including AIFF, WAV, and various compressions.
- Simultaneous output to a computer monitor and an NTSC or PAL TV monitor, VCR or camera.
- Export in QuickTime web-streaming format.
- Import and export of common EDLs with pre-read options.

## Printing to tape and exporting

- Instant playback of cuts.
- Insert and assemble to tape using device control.
- Up to 4,000x4,000-pixel resolution in any combination, including ITU-R 601 720x486-pixel and 720x576 nonsquare pixel options.
- Compressed or uncompressed output.
- 60-field processing.

## Audio capabilities

- Sampling at 8 to 48 kHz and 8 to 16 bits.
- New reverb filters.
- Real-time mixing of 8 or more audio tracks.
- Audio pan controls.
- Logarithmic audio fades.
- Scrubbing with or without pitch shifting.

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- Automatic, single-step audio transitions.
- More than 12 audio filters, including three-band and parameter equalizer, compressor/limiter, 60/120Hz hum remover, and noise gate.

## Video Capture

- Multiple resolutions and redigitizing options.
- Batch digitizing into bins.
- Support for making subclips during logging.
- Ability to add scene, shot, take, and comment notations to footage as it is being logged.
- Waveform monitor and vectorscope.
- Auto-sync compensator.

## Media Management

- Multiple bins and folders for clip and effects storage.
- Icon and list views by name and other parameters.
- Ability to open multiple sequences and programs.
- Support for multi-item sorts, sifts, and Boolean searches.
- Storage of clip information in 34 bin categories such as file size, frame rate, and comments.
- Optional subclips.
- Ability to scroll through thumbnails in the Browser window.

## Editing

- Three-point editing.
- “JKL” keyboard support.
- Match frame for replacing edits.
- L cuts.
- Multitrack trimming.
- Multiple actions, including insert, overlay, and replace.
- Ability to back-time edits in a single step.
- Active track targeting.
- Numerical trimming from timeline.
- Slip trimming and slide trimming.
- Support for editing and trimming using black (null) space.
- Sync multiple video edits to a single audio track.
- Sync detection and automatic correction.
- Markers with or without comments and durations.
- Choice of editing with offline or online files.
- One-step transition and superimpose edit mode.
- Inline transitions instead of A/B model.
- Editing palette containing the most-used functions.

## Compositing and effects

- Direct manipulation of video and images.
- Unlimited compositing layers.
- Import of Adobe Photoshop files with layers maintained to add effects and motion.
- Subpixel motion accuracy.
- Insertion of fully editable nested sequences.
- Text generator, outlined text generator as well as “Scrolling,” “Crawl” and “Typewriter”.
- Keyframe-based filters.
- Real-time wire frame playback.
- More than 75 built-in filters and keying effects.
- Support for qualified third-party After Effects plug-ins, including Ultimatte, Boris, and Cinelook.
- FXBuilder scripting language for creating custom filters and transitions.
- Ability to apply effects to time ranges, not just clips.
- Photoshop-like transfer modes, such as multiply and lighten.
- Multiple compositing methods, including alpha, blue and green screen, luminance, and more.
- Automatic alpha compositing.
- Time effects such as slow motion with frame blending.
- Motion blur and sophisticated image deinterlacing.
- Four user-defined rendering qualities for fast previews.

# 607\_Final Cut Pro 2 - Technical Specifications.pdf

- Separate render cache for each quality setting.
- More than 60 predefined transitions.

\*Refer to the list of qualified devices for compatibility information.

\*\*We are working to bring a version of Final Cut Pro to Mac OS X that takes full advantage of the new operating system.

Published Date: Mar 8, 2017

# Final Cut Pro 3 - Technical Specifications

Final Cut Pro 3 - Part Numbers	
Retail	<b>M8562Z/A</b>
Upgrade	<b>M8564Z/A</b>

## Final Cut Pro 3 System Requirements

- Macintosh computer with a 300-MHz or faster PowerPC G3 or G4 processor and built-in FireWire.
  - 500-MHz or faster single or 450-MHz dual processor Power Mac G4 or PowerBook G4 required for G4 realtime effects.
  - 667-MHz PowerBook G4 required for mobile G4 realtime effects in DV format.
- Mac OS 9.2.2 or Mac OS X v10.1.1.
- QuickTime (included).
- 256MB of RAM (384MB recommended for G4 realtime effects).
- 40MB of available disk space required for installation.
- Video Capture.
- Simultaneous video output to a computer monitor, an NTSC or PAL TV monitor, a VCR, or a camera..
- Multiple resolutions and transcoding options.
- Batch digitizing into bins.
- Support for making subclips during logging.
- Ability to add scene, shot, take, and comment notations to footage as it is being logged.
- Hardware-accurate waveform monitor and vectorscope.
- Autosync compensator.
- Long-frame indicators.

## Video Capture

- Simultaneous video output to a computer monitor, an NTSC or PAL TV monitor, a VCR, or a camera.
- Multiple resolutions and transcoding options.
- Batch digitizing into bins.
- Support for making subclips during logging.
- Ability to add scene, shot, take, and comment notations to footage as it is being logged.
- Hardware-accurate waveform monitor and vectorscope.
- Autosync compensator.
- Long-frame indicators.

## Editing

- Source/record three-point editing model.
- Unique mode-free user interface for seamless movement between editing, trimming, and effects functions.
- Realtime effects support through out-of-the-box G4 realtime effects architecture or select realtime PCI cards for realtime editing with render-free playback of dissolves, wipes, motion effects, titles, and color correction.
- Match frame.
- Extend and split edit functions.
- Support for multiple timelines in projects.
- Multiple actions, including insert, overlay, and replace.
- Ability to back-time edits in a single step.
- Active track targeting.
- Numerical trimming from timeline.
- Slip-and-slide, ripple, and roll tools.
- Through-edit indicators in timeline.
- Support for editing and trimming using black (null) space.
- Sync detection and automatic correction.
- Markers with or without comments and durations.
- Choice of editing with offline or online files.
- One-step transition and superimpose edit mode.
- Editing palette containing the most-used functions.
- Timecode Overlays and Quick-Sync indicators.
- Ability to paste and remove attribute commands.

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## Advanced media management

- Use the Media Management tool for clip—and sequence-based moving, transcoding, consolidation, trimming, and archiving.
- Convert sequences and projects between formats using the graphical before and after indicator.
- Take advantage of EDL import/export for efficient workflow between third-party offline and online systems.
- Frame accurate “digital cuts” to tape.
- View the Edit Decision List in a text window.
- Protect your work with 99 levels of undo and the time-stamped Autosave Vault.
- See the source timecode of every frame using Timecode Overlays.
- View synced clips across timeline tracks using Quick-Sync indicators.
- Take advantage of the external editor preference to define additional applications to launch and edit project elements.
- Capture video directly from most DV devices.
- Return easily to previous stages of a project with the Autosave Vault.
- Store clips and effects in multiple bins and folders.
- View icons and list views by name and other parameters.
- Open multiple sequences and programs.
- Use multi-item sorts, sifts, and Boolean searches, and display long clip names.
- Store clip information in 41 bin categories, such as file size, frame rate, and comments.
- Use optional subclips.
- Scroll through thumbnails in the Browser window.

## Printing to tape and exporting

- Insert and assemble to tape using device control.
- Up to 4000-by-4000-pixel resolution in any combination, including ITU-R 601 720-by-486-pixel and 720-by-576-nonsquare-pixel options.
- Compressed or uncompressed output.
- 60-field processing.

## Compositing and effects

- Create virtually unlimited layers of sophisticated effects using integrated, proxy-free compositing and effects architecture.
- Use Bezier curves with movable motion paths, graphs, and numerical controls to apply and control effects and animations with precise keyframe control.
- Supported PCI realtime cards (including Matrox RTMac and Pinnacle Systems’ CinéWave) use QuickTime-based realtime architecture for seamless integration with the Final Cut Pro motion tab and effects.
- Create stunning 2D and 3D animated titles, multisided video cubes, and page curls with effects tools from BorisFX and CGM.
- Manipulate video and images directly on-screen.
- Use unlimited compositing layers.
- Import Adobe Photoshop files complete with layers to assemble effects and motion.
- Apply effects with qualified third-party After Effects plug-ins.
- Enjoy the accuracy of subpixel interpolation rendering.
- Insert fully editable nested sequences.
- Use standard and advanced 3D and Scrolling Text generators.
- Use keyframe-based filters to adjust effects over time.
- Smooth compositing animations with Ease In/Ease Out motion paths.
- Build complex effects with realtime wireframe playback.
- Create custom FXScript plug-in filters and transitions using the FXBuilder scripting language.
- Apply effects to time ranges, not just clips.
- Use Photoshop-like transfer modes, such as multiply and lighten.
- Work with multiple compositing methods such as alpha, blue and green screen, and luminance, including automatic alpha compositing.
- Use time effects including slow motion with frame blending.
- Use motion blur and sophisticated image deinterlacing.
- Reduce unsteady still frames from interlaced video with the flicker filter.
- Move an entire motion path using the Canvas.
- Use low-quality render options for fast review; each of four quality settings has a separate render cache.
- Take advantage of more than 60 predefined transitions and 75 built-in filters and keying effects.

## Audio

- Eight tracks or more of audio playback in real time.
- OMF audio export for easy workflow with industry-standard mixing and finishing systems.
- Built-in audio filters, including reverb, EQ, echo, and noise gate.



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- Subframe audio editing to 1/100th of a frame.
- Sampling at 8 to 48 kHz and 8 to 16 bits.
- Audio level meters.
- Audio pan controls.
- Logarithmic audio fades.
- Scrubbing with or without pitch shifting.
- Automatic, single-step audio transitions.
- More than 12 audio filters, including three-band and parameter equalizer, compressor/limiter, 60/120-Hz hum remover, and noise gate.
- Audio peak detection for clips and sequences.
- PeakDV audio-editing tool for time compression/expansion, VST plug-in support, and batch file processing (included).

## Architecture

- Mode-free user interface for fast, seamless transitions between editing, trimming, effects, and compositing.
- Video Native YUV-based rendering engine.
- QuickView preview for viewing complex effects without waiting to render.
- Selective device control and Easy Setups for multiformat acquisition.
- QuickTime-based for outstanding support for cross-platform delivery.
- Support for Adobe After Effects plug-ins and Final Cut Pro 3 FXScript plug-ins.
- Designed for seamless performance with all current Macintosh computers.
- Optimized for PowerPC G4 with Velocity Engine, including dual processor Power Mac computers.

## Input and Output formats

- NTSC and PAL DV video using FireWire.
- Composite and component NTSC and PAL analog and uncompressed standard definition support using third-party capture cards from Pinnacle Systems and others.
- HD support for formats including 1080i, 23.976, 24p, 25, 29.97, and 30 fps (requires third-party PCI hardware).
- QuickTime video and file format export, including M-JPEG, Sorenson, Cinepak, and web streaming.
- Standard image format import (BMP, JPEG, MacPaint, Photoshop, PICT, PNG, QuickTime Image, SGI, TARGA, TIFF) with alpha channels maintained.
- Standard audio formats supported, including AIFF, and WAV.
- Import and export of common EDLs with pre-read options.

Published Date: Mar 8, 2017

# Shake 3.0 - Technical Specifications

Shake 3.0 - Part Number	
Retail	M9124Z/A

## Shake 3.0 System Requirements

### Mac OS

- Power Mac G4 or PowerBook G4 with 800MHz or faster PowerPC G4 processor; or Xserve with 1GHz or faster PowerPC G4 processor.
- Mac OS X v10.2.5.
- QuickTime 6.1 or later.
- 256MB of RAM or more.
- 1GB of available disk space for caching and temporary files.
- Graphics card with at least 32MB of video memory and OpenGL hardware acceleration.
- Display with 1280-by-1024-pixel resolution and 24-bit color.
- Three-button mouse.

### Linux

- 550MHz Pentium III, Pentium 4, or AMD Athlon processor.
- Red Hat Linux 7.2.
- 256MB of RAM or more.
- 1GB of available disk space for caching and temporary files.
- Workstation-class graphics card, such as NVIDIA Quadro2 or Quadro4, ATI Fire GL 8700 or 8800, ATI Fire GL2, or ATI Fire GL4.
- Display with 1280-by-1024-pixel resolution and 24-bit color.
- Three-button mouse.

### Irix

- 195MHz SGI Octane R10000 processor.
- Irix 6.5.12m.
- 256MB of RAM or more.
- 1GB of available disk space for caching and temporary files.
- SSI, SSE, MXI graphics.
- Three-button mouse.

## Compositing

- Unlimited number of nodes in a process tree.
- Resolution and bit depth independence.
- Control over bit depth at a local node level.
- Multiple image resolutions within same composition.
- Boolean and Image Math layer operations.
- New ability to view audio wave forms in animation curve editor.
- New audio scratch track support: Play and scrub audio on Mac OS X.
- New multi-input layer node with common blend modes.
- New: import Photoshop layers with blend modes.
- New fully editable node grouping/ungrouping function.
- Keyframable shape-based masks.
- Expression-based layer operations.
- Channel swapping and copying, including Z channel.
- Constraint of any operation to channel, field, tolerance or region.
- Screen and Z-based compositing.
- External masking capabilities for every operator.
- Support for a wide variety of third-party plug-ins including The Foundry, GenArts, RE: Vision Effects, Ultimatte and others.

## Filters

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- New film grain simulation.
- Extremely fast, high-quality Gaussian blurs.
- User-definable Convolves.
- Grain, Median, Sharpening, Embossing, Edge Detection and Radial Blur.
- Optical Defocus.
- Dilation/Erosion.
- Image-driven Blurring, Sharpening or Dilation.
- Z-Depth-based Blurring.

## Keying

- Chroma, Luma, Difference or Z-Depth keying.
- Included Photron Primatte chroma keyer.
- Included CFC Keylight chroma keyer.
- Spill-suppression.

## Color Correction and Channel Manipulation

- New Pixel Analyzer gathers image analysis data over multiple frames for use on color correction.
- Curve-based color correction.
- Color correction super node.
- Lookup table color correction.
- Extensive set of RGB, matte, Z-depth and HSV-based color correction tools.
- Logarithmic/Linear color space conversion with per-channel roll-off controls.
- Support for multiple color spaces including RGB, HSV, HLS, CMY and YUV.
- Video-legal color correction.
- Concatenation of adjacent color-corrections into one lookup table.
- Expression-based color correction.

## Warps

- Randomization and turbulence.
- Image-driven warping.
- Expression-based warping for an infinite variety of warps.
- Twirl and Pincushion.

## Paint

- Procedural, pressure sensitive vector-based paint node.
- Insert Paint nodes anywhere in the process tree.
- Flexible paint modes including clone, reveal, smudge and more.
- New: Apply tracking data to paint strokes.
- View Paint strokes in the context of transform operations.
- Switch interpolation modes at any time: single frame, persistent and frame to frame interpolation.

## Animation

- Animation of virtually every parameter, including toggle switches.
- Flexible split window animation curve editing with multiple spline types including Linear, Hermite and C-Spint.
- Automatic or manual key framing.
- Copy/Paste Key frames.
- New ability to view audio wave forms against animation curves.
- New audio analysis feature drives the animation of effect parameters based on amplitude.
- New Overlapping Key controls for moving, interpolating and replacing control vertices.
- New Curve controls for maintaining specific animation behaviors like slopes and values over a range of frames.
- New Resample function.
- Linking of any parameter to any other parameter.
- Expressions on any parameter.
- Improved hot key access to common curve editing functions.

## Engine

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- Hybrid tile-based, scan line renderer.
- True per-node control of bit-depth, at 8, 16 or 32 bits per channel (float).
- Disk-based proxies or low/hi-resolution image substitution.
- Anamorphic image support.
- New YUV 10-bit support.
- Cineon, TIFF, IFF, QuickTime, as well as 15 other formats supported.
- Macro creation for frequently used operations.
- Automatic persistent node caching.
- C-like scripting language can make a call to any available shared programming library on your system.
- Built-in runtime compiler.
- Built-in software-based GL-like renderer.
- Software Developer Kit for software extensibility.
- Command-line or scripting access to all Shake commands.
- 100% software based Batch rendering for visually identical results cross platform.
- Supports all major image formats.
- Generation of anti-aliased text using TrueType and Adobe Type 1 fonts.

## **Rotoscoping**

- Multiple Bezier style Rotoshapes per node.
- Independent animation control.
- Non-uniform edge blurring.
- New: Apply tracking data to Rotoshapes.
- Improved shape drawing techniques.
- Non-uniform, velocity-based motion blur.
- Shape parenting.

## **Transformations**

- Infinite workspace, so elements and filters are never cropped when moved out of frame.
- Tracker, stabilizer and Matchmove nodes for data gathering and processing position, rotation, scaling and corner-pinning information.
- New Tracker pre-processing reduces inaccuracies from noise in the image.
- Adaptive filtering.
- Concatenation of adjacent transformations into a single move, for speed and quality.
- 3D Move, Scroll, Rotate, Scale, Shear and Corner Pin with Motion Blur.
- Per-transformation or Global control of Motion Blur parameters.
- Motion blur with camera duration, shutter start and quality control.
- Motion blur can occur on first frame without previous motion.
- Ability to control transformation order.
- Inverse transformations.
- On-screen controls for transformations.
- In-context direct manipulation controls.

## **Interface**

- New broadcast monitor support on Mac OS X for previewing composites using common 3rd party supported hardware.
- Onscreen manipulators for image transformations.
- Multiple viewers at variable resolution or channel display.
- RAM flipbook for viewing of compositing tree at any stage; flipbook playback while rendering.
- RAM Flipbook playback while rendering.
- New QuickTime disk based flipbook on Mac OS X for longer clip playback.
- New: Preview QuickTime flipbook out to a broadcast monitor using AJA Kona and Digital Voodoo supported 3rd party hardware.
- Viewer-specific lookup tables.
- Identical interface on all supported platforms.
- In-viewer region of interest.
- In-viewer image compare buffer.
- Reconfigurable user interface.

## **Shake Qmaster**

- Network render management solution for Mac OS X, maximizes utility of existing resources, increasing ROI of Mac equipment.
- Distributed rendering allows provides uninterrupted workflow for artists by offloading processor intensive tasks to other computers.
- Qmaster can create multiple “clusters” of Apple G4 computers in order to create pools of processing power dedicated to specific jobs,

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artists or applications.

- Fault-tolerant architecture ensures successful job completion and accurate results, even in the event of resource deallocation.
- Optimized usage of network resources through load-balancing algorithms ensures efficient operation and timely job completion.
- Compatible with third party command line rendering applications running on Mac OS X.

Published Date: Oct 15, 2010

# PowerBook G4 (17-inch) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (17-inch) - Technical Specifications

Configurations	17-inch PowerBook G4
Order Number	M8793LL/A
Processor	1 GHz PowerPC G4
- L3 Cache	1MB DDR SRAM
Memory (PC100 SDRAM)	512MB PC2700 (333MHz) DDR SDRAM
- Maximum	1 GB
- Slots	2 SO-DIMM
Hard Drive	60GB Ultra ATA 100 <sup>(2)</sup>
Optical Drive	Slot-loading SuperDrive (DVD-R/CD-RW)
- DVD-R	1x write, 8x read
- CD-R	8x write
- CD-RW	4x write
- CD-ROM	24x read
USB 1.1	2 ports (12Mbps each)
FireWire 400	1 port, 400MBps
FireWire 800	1 port, 800MBps
Expansion Slot	PC Card/CardBus slot for Type I or Type II card
EtherNet (built-in)	10/100/1000BASE-T (RJ-45 connector)
Modem (built-in)	56K V.92 <sup>(3)</sup> (RJ-11 connector)
Wireless Networking (built-in)	54-Mbps AirPort Extreme networking <sup>(1)</sup> (based on IEEE 802.11g draft specification: 802.11b Wi-Fi certified); Bluetooth 1.1
Display	17-inch (diagonal) TFT widescreen
Graphics Support	NVIDIA GeForce4 440 Go with 64MB of DDR SDRAM
- Max Resolution	1440 x 900
Video External Connectors	DVI Output port (VGA using included DVI-VGA adapter), S-Video port (Composite video output using included S-video to composite adapter)
Audio Line In	minijack
Headphone Out	minijack
Stereo speakers (built-in)	yes
Microphone (built-in)	Omnidirectional (located under left speaker grille)
Accessories Included	S-video to composite adapter, DVI to VGA adapter, modem cable, power adapter, AC wall plug, power cord
Software Included	Mac OS X, QuickTime, iCal, iChat, iLife (includes iTunes, iPhoto, iMovie, and iDVD), DVD Player, Mac OS X Mail, Microsoft Internet Explorer, EarthLink (includes 30 days of free service), Acrobat Reader, Art Directors Toolkit, FAXstf, FileMaker Pro Trial, GraphicConverter, Microsoft Office v. X Test Drive, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Developer Tools, Apple Hardware Test
Size (Height/Width/Depth)	1.0" x 15.4" x 10.2" (2.6cm x 39.2cm x 25.9cm)
Weight	6.8 lbs. (3.1 kg) with battery and optical drive installed <sup>(7)</sup>
Service and Support	90 days of free telephone support and one-year limited warranty
Build-to-Order Options	Order a custom-configured eMac from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Memory	512MB - 1GB
Accessories (2)	Additional lithium batteries, and power adapters, external keyboard or mouse
Apple Displays	Apple Studio Display (17-inch flat panel), order number M7649ZM/A Apple Cinema Display (22-inch flat panel), order number M8058ZM/A Apple Cinema HD Display (23-inch flat panel), order number M8537ZM/A Apple DVI to ADC Adapter, order number M8661LL/A

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Other Products	Apple Portable Power Adapter, order number M8943LL/A 17-inch PowerBook G4 Rechargeable Battery, order number M8983G/A AirPort Extreme Base Station, order numbers M8930LL/A and M8799LL/A .Mac, order number M8778LL/A AppleCare Protection Plan, order number M8853LL/A
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Extended Service and Support	Purchase the AppleCare Protection Plan to extend your service and support to up to three full years. The plan provides support for your Mac, the Mac OS, and many Apple consumer applications, so just one phone call can help resolve most issues. You can also enroll one Apple display for coverage, provided that the PowerBook G4 and display are purchased together. For more information, visit <a href="http://www.apple.com/support/products">www.apple.com/support/products</a> .
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## Technical Specifications

<b>Processor and memory</b> <ul style="list-style-type: none"><li>1GHz PowerPC G4 processor with Velocity Engine</li><li>1MB DDR SRAM level 3 cache</li><li>167MHz system bus</li><li>512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 1GB</li></ul>	<b>Display</b> <ul style="list-style-type: none"><li>17-inch (diagonal) TFT display<ul style="list-style-type: none"><li>Support for millions of colors at 1440-by-900-pixel resolution</li><li>Supported resolutions: 1440 by 900 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio</li></ul></li></ul>	<b>Security</b> <ul style="list-style-type: none"><li>Kensington cable lock slot</li></ul>
<b>Storage</b> <ul style="list-style-type: none"><li>60GB 4200-rpm Ultra ATA/100 hard drive<sup>(2)</sup></li><li>Slot-loading SuperDrive (DVD-R/CD-RW)<ul style="list-style-type: none"><li>Writes DVD-R discs at 1x speed; reads DVDs at 8x speed</li><li>Writes CD-R discs at 8x speed; writes CD-RW discs at 4x speed</li><li>Reads CDs at 24x speed</li></ul></li></ul>	<b>Video and graphics support</b> <ul style="list-style-type: none"><li>NVIDIA GeForce4 440 Go graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory for 2D/3D graphics acceleration</li><li>Dual display and video mirroring: Simultaneously supports up to 1440 by 900 pixels on the built-in display and up to 2048 by 1536 pixels on an external display, both at millions of colors<sup>(5)</sup></li><li>DVI output port</li><li>VGA output using included DVI to VGA adapter</li><li>S-video output port</li><li>Composite video output using included S-video to composite adapter</li></ul>	<b>Keyboard and trackpad</b> <ul style="list-style-type: none"><li>Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted T arrangement), and embedded numeric keypad<ul style="list-style-type: none"><li>Illuminated fiber-optic, backlit keys</li></ul></li><li>Solid-state trackpad for precise cursor control; supports tap, double-tap, and drag capabilities</li></ul>
<b>Communications</b> <ul style="list-style-type: none"><li>Built-in 54-Mbps AirPort Extreme wireless networking<sup>1</sup> (based on IEEE 802.11g draft specification; 802.11b Wi-Fi certified)</li><li>Built-in Bluetooth 1.1</li><li>Built-in 10/100/1000BASE-T Ethernet (RJ-45 connector)</li><li>Built-in 56K V.92 modem<sup>3</sup> (RJ-11 connector)</li></ul>	<b>Audio</b> <ul style="list-style-type: none"><li>Audio line in (minijack)</li><li>Headphone out (minijack)</li><li>Two built-in stereo speakers</li><li>Internal omnidirectional microphone (located under left speaker grille)</li></ul>	<b>Ambient light sensor</b> <ul style="list-style-type: none"><li>Measures ambient light and works with integrated software to adjust keyboard illumination and screen brightness based on user preferences</li></ul>
<b>Expansion</b> <ul style="list-style-type: none"><li>One FireWire 800 port at up to 800 Mbps; one FireWire 400 port at up to 400 Mbps<sup>(4)</sup></li><li>Two 12-Mbps USB 1.1 ports</li><li>PC Card/CardBus slot for Type I or Type II card</li></ul>	<b>Battery and power</b> <ul style="list-style-type: none"><li>55-watt-hour lithium-ion prismatic battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life<sup>(6)</sup></li><li>65W power adapter with cable management system</li><li>Power adapter port</li></ul>	<b>Electrical and environmental requirements</b> <ul style="list-style-type: none"><li>Meets ENERGY STAR requirements</li><li>Line voltage: 100V to 240V AC</li><li>Frequency: 50Hz to 60Hz</li><li>Operating temperature: 50° to 95° F (10° to 35° C)</li><li>Storage temperature: 40° to 116° F (40° to 47° C)</li><li>Relative humidity: 20% to 80% noncondensing</li><li>Maximum operating altitude: 10,000 feet</li><li>Maximum storage altitude: 15,000 feet</li><li>Maximum shipping altitude: 35,000 feet</li></ul>
		<b>Size and weight</b> <ul style="list-style-type: none"><li>Height: 1.0 inch (2.6 cm)</li><li>Width: 15.4 inches (39.2 cm)</li><li>Depth: 10.2 inches (25.9 cm)</li><li>Weight: 6.8 pounds (3.1 kg) with battery and optical drive installed<sup>(7)</sup></li></ul>

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

- Wireless Internet access requires AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.
- 1GB = 1 billion bytes; actual formatted capacity less.
- Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.
- Actual rates will vary.
- Some third-party DVI displays may not support all resolutions.
- Battery life depends on configuration and use.
- Actual weight varies by configuration and manufacturing process.
- Connection to Apple flat-panel displays requires Apple DVI to ADC Adapter (sold separately).

# Shake 3.5 - Technical Specifications

Shake 3.5 - Part Number	
Retail	M9124Z/B

## Shake 3.5 System Requirements

### Mac OS X

- Power Mac G5; Power Mac G4 or PowerBook G4 with 800MHz or faster PowerPC G4 processor; or Xserve G5 or Xserve G4 with 1GHz or faster PowerPC processor.
- Mac OS X v10.3.3 or later.
- QuickTime 6.5 or later.
- 256MB of RAM or more.
- 1GB of available disk space for caching and temporary files.
- Graphics card with at least 32MB of video memory and OpenGL hardware acceleration.
- Display with 1280-by-1024-pixel resolution and 24-bit color.
- Three-button mouse.

### Linux

- 550MHz Pentium III, Pentium 4, or AMD Athlon processor.
- Red Hat Linux 9.
- 256MB of RAM or more.
- 1GB of available disk space for caching and temporary files.
- NVIDIA workstation-class graphics card such as Quadro2 or Quadro4.
- Display with 1280-by-1024-pixel resolution and 24-bit color.
- Three-button mouse.

### Availability

- Shake 3.5 for Mac OS X is available as a single workstation license or a floating network license.
- Shake 3.5 for Linux is available as a floating network license.
- Shake 3.5 is available as a render-only license on Linux and for free on Mac OS X.

### Compositing

- Unlimited number of nodes in a process tree.
- Resolution and bit depth independence.
- Control over bit depth at a local node level.
- Multiple image resolutions within same composition.
- Boolean and Image Math layer operations.
- Ability to view audio wave forms in animation curve editor.
- Audio scratch track support: Play and scrub audio on Mac OS X.
- Multi-input layer node with common blend modes.
- Import Photoshop layers with blend modes.
- Fully editable node grouping/ungrouping function.
- Keyframable shape-based masks.
- Expression-based layer operations.
- Channel swapping and copying, including Z channel.
- Constraint of any operation to channel, field, tolerance or region.
- Screen and Z-based compositing.
- External masking capabilities for every operator.
- Support for a wide variety of third-party plug-ins including The Foundry, GenArts, RE: Vision Effects, Ultimatte and others.

### Filters

- Film grain simulation.
- Extremely fast, high-quality Gaussian blurs.



# 610\_Shake 3.5 - Technical Specifications.pdf

- User-definable Convolves.
- Grain, Median, Sharpening, Embossing, Edge Detection and Radial Blur.
- Optical Defocus.
- Dilation/Erosion.
- Image-driven Blurring, Sharpening or Dilation.
- Z-Depth-based Blurring.

## Keying

- Chroma, Luma, Difference or Z-Depth keying.
- Included Photron Primatte chroma keyer.
- Included CFC Keylight chroma keyer.
- Spill-suppression.

## Color Correction and Channel Manipulation

- Pixel Analyzer gathers image analysis data over multiple frames for use on color correction.
- Curve-based color correction.
- Color correction super node.
- Lookup table color correction.
- Extensive set of RGB, matte, Z-depth and HSV-based color correction tools.
- Logarithmic/Linear color space conversion with per-channel roll-off controls.
- Support for multiple color spaces including RGB, HSV, HLS, CMY and YUV.
- Video-legal color correction.
- Concatenation of adjacent color-corrections into one lookup table.
- Expression-based color correction.

## Warps

- New shape-based warper and morpher nodes.
- Randomization and turbulence.
- Image-driven warping.
- Expression-based warping for an infinite variety of warps.
- Twirl and Pincushion.

## Paint

- Procedural, pressure sensitive vector-based paint node.
- Insert Paint nodes anywhere in the process tree.
- Flexible paint modes including clone, reveal, smudge and more.
- Apply tracking data to paint strokes.
- View Paint strokes in the context of transform operations.
- Switch interpolation modes at any time: single frame, persistent and frame to frame interpolation.

## Animation

- Animation of virtually every parameter, including toggle switches.
- Flexible split window animation curve editing with multiple spline types including Linear, Hermite and C-Spint.
- Automatic or manual key framing.
- Copy/Paste Key frames.
- Ability to view audio wave forms against animation curves.
- Audio analysis feature drives the animation of effect parameters based on amplitude.
- Overlapping Key controls for moving, interpolating and replacing control vertices.
- Curve controls for maintaining specific animation behaviors like slopes and values over a range of frames.
- Resample function.
- Linking of any parameter to any other parameter.
- Expressions on any parameter.
- Improved hot key access to common curve editing functions.

## Engine

# 610\_Shake 3.5 - Technical Specifications.pdf

- Improved playback caching.
- Playback limiting support.
- Improved 10-bit and 16-bit QuickTime support.
- Improved Apple Uncompressed 8- and 10-bit 4:2:2 support.
- DPX Image header preservation.
- Support for custom file header metadata.
- Flipbook customization.
- Hybrid tile-based, scan line renderer.
- True per-node control of bit-depth, at 8, 16 or 32 bits per channel (float).
- Disk-based proxies or low/hi-resolution image substitution.
- Anamorphic image support.
- YUV 10-bit support.
- Cineon, TIFF, IFF, QuickTime, as well as 15 other formats supported.
- Macro creation for frequently used operations.
- Automatic persistent node caching.
- C-like scripting language can make a call to any available shared programming library on your system.
- Built-in runtime compiler.
- Built-in software-based GL-like renderer.
- Software Developer Kit for software extensibility.
- Command-line or scripting access to all Shake commands.
- 100% software based Batch rendering for visually identical results cross platform.
- Supports all major image formats.
- Generation of anti-aliased text using TrueType and Adobe Type 1 fonts.

## Rotoscoping

- Multiple Bezier style Rotoshapes per node.
- Independent animation control.
- Non-uniform edge blurring.
- Apply tracking data to Rotoshapes.
- Improved shape drawing techniques.
- Non-uniform, velocity-based motion blur.
- Shape parenting.

## Transformations

- 
- Infinite workspace, so elements and filters are never cropped when moved out of frame.
- Tracker, stabilizer and Matchmove nodes for data gathering and processing position, rotation, scaling and corner-pinning information.
- Tracker pre-processing reduces inaccuracies from noise in the image.
- Adaptive filtering.
- Concatenation of adjacent transformations into a single move, for speed and quality.
- 3D Move, Scroll, Rotate, Scale, Shear and Corner Pin with Motion Blur.
- Per-transformation or Global control of Motion Blur parameters.
- Motion blur with camera duration, shutter start and quality control.
- Motion blur can occur on first frame without previous motion.
- Ability to control transformation order.
- Inverse transformations.
- On-screen controls for transformations.
- In-context direct manipulation controls.

## Interface

- Broadcast monitor support on Mac OS X for previewing composites using common 3rd party supported hardware.
- Onscreen manipulators for image transformations.
- Multiple viewers at variable resolution or channel display.
- RAM flipbook for viewing of compositing tree at any stage; flipbook playback while rendering.
- RAM Flipbook playback while rendering.
- QuickTime disk based flipbook on Mac OS X for longer clip playback.
- Preview QuickTime flipbook out to a broadcast monitor using AJA Kona supported 3rd party hardware.
- Viewer-specific lookup tables.
- Identical interface on all supported platforms.
- In-viewer region of interest.

# 610\_Shake 3.5 - Technical Specifications.pdf

- In-viewer image compare buffer.
- Reconfigurable user interface.

## Shake Qmaster

- New Shake integrated UI for job creation and monitoring.
- Integrated Maya rendering support.
- Network render management solution for Mac OS X, maximizes utility of existing resources, increasing ROI of Mac equipment.
- Distributed rendering provides uninterrupted workflow for artists by offloading processor intensive tasks to other computers.
- Qmaster can create multiple “clusters” of Apple G5 and G4 computers in order to create pools of processing power dedicated to specific jobs, artists or applications.
- Fault-tolerant architecture ensures successful job completion and accurate results, even in the event of resource deallocation.
- Optimized usage of network resources through load-balancing algorithms ensures efficient operation and timely job completion.
- Compatible with third party command line rendering applications running on Mac OS X.

Published Date: Oct 15, 2010

# Shake 4.0 - Technical Specifications

Shake 4.0 - Part Number	
Retail	M9935Z/A

## Shake 4.0 System Requirements

### Mac OS X

- Power Mac G5; Power Mac G4 or PowerBook G4 with 1GHz or faster PowerPC G4 processor.
- Mac OS X v10.3.9 or Mac OS X v10.4.
- QuickTime 7.0 or later.
- 512MB of RAM or more.
- 1GB of available disk space for caching and for temporary files.
- AGP graphics card with at least 32MB of video memory and OpenGL hardware acceleration.
- Display with 1280-by-1024-pixel resolution and 24-bit color.
- Three-button mouse.
- Optional: AJA Kona or Blackmagic DeckLink card required to preview composites on a broadcast video monitor.

### Linux

- 1GHz Pentium III, Pentium 4, or AMD Athlon processor or faster.
- Red Hat Linux 9.
- 512MB of RAM or more.
- 1GB of disk space for caching and temporary files.
- Workstation-class graphics card, such as NVIDIA Quadro2 or Quadro4 with NVIDIA 7664 drivers or higher.
- Display with 1280-by-1024-pixel resolution and 24-bit color.
- Three-button mouse.

## Licensing

- Shake for Mac OS X is available as a single workstation license or a floating network license.
- Shake for Linux is available as a floating network license.
- Shake is available as a render-only license on Linux and for free on Mac OS X.

## Compositing

- Process tree-based compositing.
- Control over bit depth at a local node level.
- Mix image resolutions within a composition.
- 3D Multi-Plane node with camera controls.
- Import Maya compatible camera tracking data.
- Customizable quad split viewer.
- Multi-input layer node with blend modes.
- Boolean and Image Math layer operations.
- Import Photoshop layers with blend modes.
- Fully editable node grouping/ungrouping.
- Channel swapping and copying.
- Constraint of any operation to channel, field, tolerance or region.
- External masking capabilities for every operator.
- Audio scratch track support on Mac OS X.
- Support for third-party plug-ins including The Foundry, GenArts and RE: Vision Effects.

## Filters

- Film grain simulation.
- Extremely fast, high-quality Gaussian blurs.
- User-definable Convolves.
- Grain, Median, Sharpening, Embossing, Edge Detection, Radial Blur and Z-Depth-based Blur.
- Optical Defocus.

# 611\_Shake 4.0 - Technical Specifications.pdf

- Dilation/Erosion.
- Image-driven Blurring, Sharpening or Dilation.
- Keying.
- Included 32-bit Photron Primatte chroma keyer.
- Included 32-bit CFC Keylight chroma keyer.
- Chroma, Luma, Difference or Z-Depth keying.
- Spill suppression.

## Color Correction and Channel Manipulation

- Pixel Analyzer gathers image analysis data over multiple frames for use on color correction.
- Curve-based color correction.
- Color correction super node.
- Lookup table color correction.
- Extensive set of RGB, matte, Z-depth and HSV-based color correction tools.
- Logarithmic/Linear color space conversion with per-channel roll-off controls.
- Support for multiple color spaces including RGB, HSV, HLS, CMY and YUV.
- Video-legal color correction.
- Concatenation of adjacent color-corrections into one lookup table.

## Warps

- Shape-based warper and morpher nodes.
- New Lens warp node.
- Randomization and turbulence.
- Twirl and Pincushion.
- Image- and expression-based warping.

## Paint

- Procedural, pressure-sensitive vector-based paint.
- Insert Paint nodes anywhere in the process tree.
- Clone, reveal and smudge paint modes.
- Apply tracking data to paint strokes.
- View Paint strokes in context of transforms.
- Switch interpolation modes at any time: single frame, persistent and frame to frame interpolation.

## Animation

- Animate virtually any slider or toggle.
- Flexible split window animation curve editing.
- Automatic or manual key framing.
- Copy/Paste Key frames.
- View audio wave forms against animation curves.
- Drive parameter animation based on audio.
- Overlapping Key controls for moving, interpolating and replacing control vertices.
- Curve controls for maintaining keyframe slopes and values over a range of frames.
- Resample function.
- Linking of any parameter to any other parameter.
- Expressions on any parameter.

## Engine

- Optical flow-based retiming.
- Open EXR, Cineon and DPX support.
- 10-bit and 16-bit QuickTime support.
- Apple Uncompressed 8- and 10-bit 4:2:2 support.
- 15 other image file formats supported.
- Support for custom file header metadata.
- Hybrid tile-based, scan line renderer.
- True per-node control of bit-depth, at 8, 16 or 32 bits per channel (float).
- Domain of Definition processing optimization.

# 611\_Shake 4.0 - Technical Specifications.pdf

- Disk-based or on-the-fly proxy system.
- Anamorphic image support.
- Macro creation for frequently used operations.
- Automatic persistent node caching.
- C-like scripting language can make calls to any locally available shared programming library.
- Built-in runtime compiler.
- Built-in software-based GL-like renderer.
- Software Developer Kit for software extensibility.
- Command-line scripting access to all commands.
- 100% software-based rendering for visually identical results cross platform.
- Generation of anti-aliased text using TrueType and Adobe Type 1 fonts.

## Rotoscoping

- Multiple Bezier style Rotoshapes per node.
- Independent animation control.
- Non-uniform edge blurring.
- Apply tracking data to Rotoshapes and points.
- Non-uniform, velocity-based motion blur.
- Shape parenting.

## Transformations

- Infinite workspace, so elements and filters are never cropped when moved out of frame.
- Pan, Rotate, Scale, Shear and Corner Pin.
- Tracker, stabilizer and Matchmove nodes.
- New Smoothcam optical flow based stabilization.
- Tracker pre-processing reduces inaccuracies.
- New Auto-align.
- Optical flow-based resizing.
- Concatenation of adjacent transformations into a single move, for speed and quality.
- Per-transformation or global Motion Blur control.
- Motion blur with shutter and quality control.
- Apply Motion blur initial frame setting.
- Ability to control transformation order.
- Inverse transformations.
- In-context direct manipulation controls.

## Interface

- Preview composites on broadcast monitors using third-party supported Mac OS X hardware.
- On-screen manipulators for transformations.
- Multiple resolution or channel viewers.
- Integrated Truelight Monitor calibration.
- RAM flipbook for viewing of compositing tree at any stage; flipbook playback while rendering.
- RAM Flipbook playback while rendering.
- QuickTime disk-based flipbook on Mac OS X.
- Viewer-specific lookup tables.
- In-viewer region of interest.
- In-viewer image compare buffer.

## Apple Qmaster

- Network render management for Mac OS X.
- Integrated UI for job creation and monitoring.
- Integrated Maya rendering support.
- Offloading processor intensive tasks to other computers.
- Create multiple clusters of Mac or Xserve systems for specific jobs, artists or applications.
- Fault-tolerant architecture ensures successful job completion and accurate results, even in the event of resource deallocation.
- Optimized usage of network resources through load-balancing algorithms.
- Compatible with third-party command line rendering applications running on Mac OS X.



# Shake 4.1 - Technical Specifications

Shake 4.1 - Part Number	
Retail	MA434Z/A
Upgrade	M9937Z/A

## Shake 4.1 System Requirements

### Mac OS X

- 1GHz or faster PowerPC G4, PowerPC G5 or Intel Core processor.
- Mac OS X 10.4.6 or later.
- QuickTime 7.0.4 or later.
- 512MB (or more) of RAM.
- 1GB hard disk space for disk cache
- AGP, PCI Express or Intel graphics processor with at least 32MB of video memory and OpenGL hardware acceleration
- Display with 1280-by-1024-pixel or 1440-by-900-pixel resolution and 24-bit color.
- Three-button mouse.
- Optional: AJA Kona or Blackmagic DeckLink card required to preview composites on a broadcast video monitor.

### Linux

- 1GHz (or faster) Pentium III, Pentium 4, or AMD Athlon processor or faster.
- Fedora Core 4.
- 512MB (or more) of RAM.
- 1GB hard disk space for disk cache.
- Workstation-class graphics card, such as NVIDIA Quadro2 or Quadro4.
- Display with 1280-by-1024-pixel or 1440-by-900-pixel resolution and 24-bit color.
- Three-button mouse.

## Technical Specifications

### Compositing

- Process tree-based compositing.
- Control over bit depth at a local node level.
- Mix image resolutions within a composition.
- 3D Multi-Plane node with camera controls.
- Import Maya compatible camera tracking data.
- Customizable quad split viewer.
- Multi-input layer node with blend modes.
- Boolean and Image Math layer operations.
- Import Photoshop layers with blend modes.
- Fully editable node grouping/ungrouping.
- Channel swapping and copying.
- Constraint of any operation to channel, field, tolerance or region.
- External masking capabilities for every operator.
- Audio scratch track support on Mac OS X.
- Support for third-party plug-ins including The Foundry, GenArts and RE: Vision Effects.

### Filters

- Film grain simulation.
- Extremely fast, high-quality Gaussian blurs.
- User-definable Convolves.
- Grain, Median, Sharpening, Embossing, Edge Detection, Radial Blur and Z-Depth-based Blur.
- Optical Defocus.
- Dilation/Erosion.



# 612\_Shake 4.1 - Technical Specifications.pdf

- Image-driven Blurring, Sharpening or Dilation.
- Keying.
- Included 32-bit Photron Primatte chroma keyer.
- Included 32-bit CFC Keylight chroma keyer.
- Chroma, Luma, Difference or Z-Depth keying.
- Spill suppression.

## Color Correction and Channel Manipulation

- Pixel Analyzer gathers image analysis data over multiple frames for use on color correction.
- Curve-based color correction.
- Color correction super node.
- Lookup table color correction.
- Extensive set of RGB, matte, Z-depth and HSV-based color correction tools.
- Logarithmic/Linear color space conversion with per-channel roll-off controls.
- Support for multiple color spaces including RGB, HSV, HLS, CMY and YUV.
- Video-legal color correction.
- Concatenation of adjacent color-corrections into one lookup table.

## Warps

- Shape-based warper and morpher nodes.
- New Lens warp node.
- Randomization and turbulence.
- Twirl and Pincushion.
- Image- and expression-based warping.

## Paint

- Procedural, pressure-sensitive vector-based paint.
- Insert Paint nodes anywhere in the process tree.
- Clone, reveal and smudge paint modes.
- Apply tracking data to paint strokes.
- View Paint strokes in context of transforms.
- Switch interpolation modes at any time: single frame, persistent and frame to frame interpolation.

## Animation

- Animate virtually any slider or toggle.
- Flexible split window animation curve editing.
- Automatic or manual key framing.
- Copy/Paste Key frames.
- View audio wave forms against animation curves.
- Drive parameter animation based on audio.
- Overlapping Key controls for moving, interpolating and replacing control vertices.
- Curve controls for maintaining keyframe slopes and values over a range of frames.
- Resample function.
- Linking of any parameter to any other parameter.
- Expressions on any parameter.

## Engine

- Optical flow-based retiming.
- Open EXR, Cineon and DPX support.
- 10-bit and 16-bit QuickTime support.
- Apple Uncompressed 8- and 10-bit 4:2:2 support.
- 15 other image file formats supported.
- Support for custom file header metadata.
- Hybrid tile-based, scan line renderer.
- True per-node control of bit-depth, at 8, 16 or 32 bits per channel (float).
- Domain of Definition processing optimization.
- Disk-based or on-the-fly proxy system.

# 612\_Shake 4.1 - Technical Specifications.pdf

- Anamorphic image support.
- Macro creation for frequently used operations.
- Automatic persistent node caching.
- C-like scripting language can make calls to any locally available shared programming library.
- Built-in runtime compiler.
- Built-in software-based GL-like renderer.
- Software Developer Kit for software extensibility.
- Command-line scripting access to all commands.
- 100% software-based rendering for visually identical results cross platform.
- Generation of anti-aliased text using TrueType and Adobe Type 1 fonts.

## **Rotoscoping**

- Multiple Bezier style Rotoshapes per node.
- Independent animation control.
- Non-uniform edge blurring.
- Apply tracking data to Rotoshapes and points.
- Non-uniform, velocity-based motion blur.
- Shape parenting.

## **Transformations**

- Infinite workspace, so elements and filters are never cropped when moved out of frame.
- Pan, Rotate, Scale, Shear and Corner Pin.
- Tracker, stabilizer and Matchmove nodes.
- New Smoothcam optical flow based stabilization.
- Tracker pre-processing reduces inaccuracies.
- New Auto-align.
- Optical flow-based resizing.
- Concatenation of adjacent transformations into a single move, for speed and quality.
- Per-transformation or global Motion Blur control.
- Motion blur with shutter and quality control.
- Apply Motion blur initial frame setting.
- Ability to control transformation order.
- Inverse transformations.
- In-context direct manipulation controls.

## **Interface**

- Preview composites on broadcast monitors using third-party supported Mac OS X hardware.
- On-screen manipulators for transformations.
- Multiple resolution or channel viewers.
- Integrated Truelight Monitor calibration.
- RAM flipbook for viewing of compositing tree at any stage; flipbook playback while rendering.
- RAM Flipbook playback while rendering.
- QuickTime disk-based flipbook on Mac OS X.
- Viewer-specific lookup tables.
- In-viewer region of interest.
- In-viewer image compare buffer.

## **Apple Qmaster**

- Network render management for Mac OS X.
- Integrated UI for job creation and monitoring.
- Integrated Maya rendering support.
- Offloading processor intensive tasks to other computers.
- Create multiple clusters of Mac or Xserve systems for specific jobs, artists or applications.
- Fault-tolerant architecture ensures successful job completion and accurate results, even in the event of resource deallocation.
- Optimized usage of network resources through load-balancing algorithms.
- Compatible with third-party command line rendering applications running on Mac OS X.

# Final Cut Pro 1 - Technical Specifications

## Final Final Cut Pro 1 System requirements:

- 266-MHz Power Macintosh G3 computer (300 MHz required for DV), or the new PowerBook G3 with the 333 MHz and 400-MHz PowerPC G3 processors.
- Mac OS 8.5 or later.
- 128 MB of RAM.
- 6 GB hard disk (one or more separate Ultra2 LVD SCSI media drives recommended).
- One of the following video capture systems (optional):
  - A DV digital video source connected to a computer equipped with an Apple FireWire port (built in or on an Apple PCI card).
  - An analog video source and a certified QuickTime-compatible video capture card or device.
- Dual-monitor support (optional).

Published Date: Jul 26, 2017

# Final Cut Pro 1.2.5 - Technical Specifications

Final Cut Pro 1.2.5 - Part Number	
Retail	M7615Z/A

## Final Cut Pro 1.2.5 System requirements:

- 266-MHz Power Macintosh G3 (300 MHz required for DV), Power Mac G4 computer, 300-MHz PowerBook G3 Series computer, iMac DV.
- Mac OS 9 (Mac OS 9.0.4 is recommended).
- QuickTime 4.1.2 or later.
- 128 MB of RAM.
- 6 GB hard disk (one or more separate Ultra2 LVD SCSI media drives recommended).
- One of the following video capture systems (optional):
- A DV digital video source connected to a computer with a FireWire (IEEE 1394; Sony i.LINK) port, either built in or provided by an Apple FireWire Kit.
  - For PowerBook G3 Series computers: A Newer Technology FireWire 2 Go card.
  - An analog video source and a Final Cut Pro qualified video capture card or device.
- Dual-monitor support (optional).

Published Date: Oct 15, 2010

# iMac (20-inch, Mid 2009) - Technical Specifications

## Size and weight

### 20-inch iMac

Height:  
18.5 inches (46.9 cm)  
Width:  
19.1 inches (48.5 cm)  
Depth:  
7.4 inches (18.9 cm)  
Weight:  
20 pounds (9.1 kg)<sup>1</sup>

## Connections and expansion

- One FireWire 800 port; 7 watts
- Total of six USB 2.0 ports: four ports on computer, two ports on wired keyboard

## Communications

- Built-in AirPort Extreme Wi-Fi wireless networking (based on IEEE 802.11n draft specification);<sup>2</sup> IEEE 802.11a/b/g compatible
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Internal 24-watt digital amplifier
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone
- Support for Apple Stereo Headset with microphone

## Environmental Status Report

- Arsenic-free display glass
- BFR-free
- PVC-free (internal cables)
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR 5.0 requirements
- Rated EPEAT Gold

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Idle	3.1	19
Hard drive accessing	3.1	20
CD drive accessing	3.3	23

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

- Built-in 20-inch (viewable) glossy widescreen TFT active-matrix liquid crystal display

# 616\_iMac (20-inch, Mid 2009) - Technical Specifications.pdf

- Resolution: 1680 by 1050 pixels
- Millions of colors at all resolutions
- Typical viewing angle: 160° horizontal, 160° vertical
- Typical brightness: 290 cd/m2
- Typical contrast ratio: 800:1

## Graphics and video support

- NVIDIA GeForce 9400M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>
- Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI via adapter<sup>4</sup>
- Built-in iSight camera
- Support for extended desktop and video mirroring modes
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display

## Processor and memory

- One of the following:
  - 2.0GHz Intel Core 2 Duo processor
  - 2.26GHz Intel Core 2 Duo processor
- 3MB shared L2 cache at full processor speed
- 1066MHz frontside bus
- 1GB (one 1GB SO-DIMM) or 2GB (two 1GB SO-DIMMs) of 1066MHz DDR3 SDRAM; two SO-DIMM slots support up to 8GB

## Storage

### Hard drive<sup>5</sup>

- 160GB 7200-rpm Serial ATA hard drive<sup>5</sup>
  - Optional 320GB 7200-rpm Serial ATA hard drive

### Optical drive

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Writes DVD+R DL and DVD-R DL discs at up to 4x speed
- Writes DVD-R and DVD+R discs at up to 8x speed
- Writes DVD-RW discs at up to 6x speed and DVD+RW discs at up to 8x speed
- Reads DVDs at up to 8x speed
- Writes CD-R discs at up to 24x speed
- Writes CD-RW discs at up to 16x speed
- Reads CDs at up to 24x speed

## Electrical and operating requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 200W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## What's in the box

- iMac
- Apple Keyboard
- Mighty Mouse
- Cleaning cloth
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

## Configurations

20-inch iMac(MC015LL/A)

20-inch iMac(MC015LL/B)

20-inch iMac(MC015LL/C)

# 616\_iMac (20-inch, Mid 2009) - Technical Specifications.pdf

Processor	2.0GHz Intel Core 2 Duo	2.6GHz Intel Core 2 Duo	2.6GHz Intel Core 2 Duo
L2 cache	3MB shared	3MB shared	3MB shared
Frontside bus	1066MHz	1066MHz	1066MHz
Memory	1GB (one 1GB SO-DIMM) of 1066MHz DDR3 SDRAM; supports up to 8GB	1GB (one 1GB SO-DIMM) of 1066MHz DDR3 SDRAM; supports up to 8GB	2GB (two 1GB SO-DIMM) of 1066MHz DDR3 SDRAM; supports up to 8GB
Hard drive	160GB Serial ATA <sup>5</sup> ; 7200 rpm		
Optical drive	Slot-loading 8x SuperDrive with 4x double-layer burning (DVD±R DL/DVD±RW/CD-RW)		
Display	20-inch (viewable) glossy widescreen TFT active-matrix LCD, 1680 by 1050 pixels, millions of colors		
Video	Built-in iSight camera; Mini DisplayPort output with support for DVI, dual-link DVI, and VGA video connections via adapter <sup>4</sup>		
Graphics	NVIDIA GeForce 9400M with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>		
FireWire	One FireWire 800 port; 7 watts		
USB	Four USB 2.0 ports on computer; two USB 2.0 ports on keyboard		
Audio	Built-in stereo speakers with 24-watt digital amplifier, built-in microphone, optical digital audio output/headphone out, optical digital audio input/audio line in		
Software	Mac OS X v10.5 Leopard		Mac OS X v10.6 Snow Leopard
	• Mac OS X includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)		
	iLife '09		iLife '11
Hardware accessories	• iLife includes iPhoto, iMovie, iDVD, iWeb, GarageBand		
Ethernet	Built-in 10/100/1000BASE-T (Gigabit)		
Wireless	Built-in AirPort Extreme Wi-Fi (802.11n) <sup>2</sup>		
Configure-to-order options	Apple Keyboard and Apple Mighty Mouse		
	• 2GB (two 1GB) or 4GB (two 2GB) Memory Upgrade		• 4GB (two 2GB) Memory Upgrade
Configure-to-order options	• 320GB Hard Drive		
	• Apple Keyboard with Numeric Keypad		
Configure-to-order options	• Apple USB Modem		

# 616\_iMac (20-inch, Mid 2009) - Technical Specifications.pdf

## Limited warranty and service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

## Apple and the global environment

Learn more about Apple's dedication to reducing the environmental impact of our products and process. The [Apple Product Environmental Specification](#) details the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Options

### Accessories

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station
- Apple 8x DVD-R Media Kit
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple FireWire Cable
- AppleCare Protection Plan

### Applications

- iWork
- Aperture
- Logic Express

- 
1. Weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. Adapters are sold separately.
  5. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.

Published Date: Mar 8, 2017



# MacBook Air (11-inch, Late 2010) - Technical Specifications

## Size and weight

- Height:  
0.11-0.68 inch (0.3-1.7 cm)
- Width:  
11.8 inches (29.95 cm)
- Depth:  
7.56 inches (19.2 cm)
- Weight:  
2.3 pounds (1.06 kg)<sup>1</sup>

## Processor and memory

- 1.4GHz Intel Core 2 Duo processor with 3MB on-chip shared L2 cache; or optional 1.6GHz Intel Core 2 Duo processor with 3MB shared L2 cache
- 800MHz frontside bus
  - 2GB of 1066MHz DDR3 SDRAM onboard (4GB maximum)

## Storage<sup>2</sup>

- Flash Storage**  
  
64GB
- Flash Storage**  
  
128GB

## Environmental Status Report

- MacBook Air is designed with the following features to reduce its environmental impact:
- Highly recyclable aluminum enclosure
  - Mercury-free LED-backlit display
  - Arsenic-free glass
  - BFR-free
  - PVC-free<sup>6</sup>
  - Meets ENERGY STAR requirements
  - Rated EPEAT Gold<sup>7</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB	Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)
Idle	2.6	7
Hard drive accessing	no value	no value
CD drive accessing	no value	no value

- L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
- L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
- 1 B (bel) = 10 dB (decibel).

## Display

**11.6-inch** (diagonal) high-resolution LED-backlit glossy widescreen display with support for millions of colors

# 617\_MacBook Air (11-inch, Late 2010) - Technical Specifications.pdf

**Supported resolutions:** 1366 by 768 (native), 1344 by 756, 1280 by 720, 1024 by 576 pixels at 16:9 aspect ratio; 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

Mini DisplayPort

### Pure digital video output

- **DVI output** using Mini DisplayPort to DVI Adapter (sold separately)
- **VGA output** using Mini DisplayPort to VGA Adapter (sold separately)
- **Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- **HDMI output** using a third-party Mini DisplayPort to HDMI adapter (sold separately)

NVIDIA GeForce 320M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>

Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors

FaceTime camera

## Keyboard and trackpad

- Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Peripheral connections

- USB 2.0
- Mini DisplayPort
- MagSafe
- USB 2.0
- Headphone
- Microphone

## Audio

- Stereo speakers
- Omnidirectional microphone
- Headphone minijack
- Support for Apple Earphones with Remote and Mic

## Communications

AirPort Extreme Wi-Fi wireless networking<sup>4</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible

Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology

Apple USB Ethernet Adapter (sold separately)

## Battery and power<sup>5</sup>

Built-in 35-watt-hour lithium-polymer battery

45W MagSafe power adapter with cable management system

MagSafe power port

- Up to 5 hrs  
wireless productivity
- Up to 30 days  
standby time

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

- 11-inch MacBook Air
- 45W MagSafe power adapter, AC wall plug, and power cord
- Printed and electronic documentation
- Software Reinstall Drive

## Included software

### Mac OS X Snow Leopard

Includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, and more.

### iLife

Includes iPhoto, iMovie, GarageBand, iWeb, and iDVD.

## DVD or CD Sharing

Without a built-in optical drive, how do you install new applications? Simply use DVD or CD Sharing. This convenient feature of Mac OS X lets you wirelessly “borrow” the optical drive of a nearby Mac or PC. So you can install applications from a DVD or CD and have full access to an optical drive without having to carry one around.

## Configurations

	11-inch MacBook Air (MC505LL/A)	11-inch MacBook Air (MC506LL/A)
<b>Enclosure</b>	Precision aluminum unibody	
<b>Processor</b>	1.4GHz Intel Core 2 Duo	
<b>L2 cache</b>	3MB shared	
<b>System bus</b>	800MHz	
<b>Memory</b>	2GB of 1066MHz DDR3 SDRAM onboard (4GB maximum)	
<b>Storage<sup>2</sup></b>	64GB of flash storage	128GB of flash storage
<b>Slot-loading optical drive</b>	Optional external USB MacBook Air SuperDrive (sold separately)	
<b>Graphics</b>	NVIDIA GeForce 320M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>	
<b>Video</b>	FaceTime camera; Mini DisplayPort output port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)	
<b>Display</b>	11.6-inch (diagonal) high-resolution LED-backlit glossy widescreen display, 1366-by-768 resolution	
<b>USB</b>	Two USB 2.0 ports (up to 480 Mbps)	
<b>Audio</b>	Stereo speakers, omnidirectional microphone, headphone minijack	
<b>Networking</b>	Apple USB Ethernet Adapter (sold separately)	
<b>Wireless</b>	AirPort Extreme Wi-Fi (based on IEEE 802.11n specification) <sup>4</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology	
<b>Hardware accessories</b>	45W MagSafe Power Adapter, AC wall plug, power cord	

	11-inch MacBook Air (MC505LL/A)	11-inch MacBook Air (MC506LL/A)
<b>Limited warranty and service</b>	Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
<b>Apple and the global environment</b>	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
<b>Recycling</b>	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Accessories

### MacBook Air SuperDrive

Play or burn discs directly with the external USB-based MacBook Air SuperDrive. Thin, light, and easy to take with you, this drive is designed specifically for MacBook Air.

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Size: 139 x 139 x 17 mm / 5.47 x 5.47 x 0.67 inches (L x W x H)
- Weight: 335 g (0.74 pound)
- Requires MacBook Air with available USB 2.0 port

### MagSafe Airline Adapter

Plug into your airline seat power port and keep MacBook Air powered up for the entire flight.

Connect your MacBook Air to an external display or projector using one of these adapters.

### Mini DisplayPort to DVI Adapter

### Mini DisplayPort to Dual-Link DVI Adapter

### Mini DisplayPort to VGA Adapter

- Time Capsule
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Magic Mouse
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. 1GB=1 billion bytes; actual formatted capacity less.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  5. Testing conducted by Apple in September 2010 using preproduction 1.86GHz Intel Core 2 Duo–based 13-inch MacBook Air units and preproduction 1.4GHz Intel Core 2 Duo–based 11-inch MacBook Air units. The wireless productivity test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Standby testing conducted by Apple in September 2010 using preproduction 1.86GHz and 2.13GHz Intel Core 2 Duo–based 13-inch MacBook Air units as well as preproduction 1.4GHz and 1.6GHz Intel Core 2 Duo–based 11-inch MacBook Air units. The standby test measures battery life by allowing a system, connected to a wireless network, to enter deep sleep mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  6. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, Venezuela, and other regions where agency approvals are given.
  7. MacBook Air achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.

# MacBook Air (13-inch, Late 2010) - Technical Specifications

## Size and weight

- Height:  
0.11-0.68 inch (0.3-1.7 cm)
- Width:  
12.8 inches (32.5 cm)
- Depth:  
8.94 inches (22.7 cm)
- Weight:  
2.9 pounds (1.32 kg)<sup>1</sup>

## Processor and memory

- 1.86GHz Intel Core 2 Duo processor with 6MB on-chip shared L2 cache; or optional 2.13GHz Intel Core 2 Duo processor with 6MB shared L2 cache
- 1066MHz frontside bus
  - 2GB of 1066MHz DDR3 SDRAM onboard (4GB maximum)

## Storage<sup>2</sup>

- Flash Storage**  
  
128GB
- Flash Storage**  
  
256GB

## Environmental Status Report

- MacBook Air is designed with the following features to reduce its environmental impact:
- Highly recyclable aluminum enclosure
  - Mercury-free LED-backlit display
  - Arsenic-free glass
  - BFR-free
  - PVC-free<sup>6</sup>
  - Meets ENERGY STAR requirements
  - Rated EPEAT Gold<sup>7</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB	Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)
Idle	2.6	8
Hard drive accessing	no value	no value
CD drive accessing	no value	no value

- L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
- L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
- 1 B (bel) = 10 dB (decibel).

## Display

**13.3-inch** (diagonal) high-resolution LED-backlit glossy widescreen display with support for millions of colors

# 618\_MacBook Air (13-inch, Late 2010) - Technical Specifications.pdf

**Supported resolutions:** 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

Mini DisplayPort

### Pure digital video output

- **DVI output** using Mini DisplayPort to DVI Adapter (sold separately)
- **VGA output** using Mini DisplayPort to VGA Adapter (sold separately)
- **Dual-link DVI output** using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- **HDMI output** using a third-party Mini DisplayPort to HDMI adapter (sold separately)

NVIDIA GeForce 320M graphics processor with 256MB of DDR3 SDRAM shared with main memory<sup>3</sup>

Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors

FaceTime camera

## Keyboard and trackpad

- Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Peripheral connections

- SD card
- USB 2.0
- Mini DisplayPort
- MagSafe
- USB 2.0
- Headphone
- Microphone

## Audio

- Stereo speakers
- Omnidirectional microphone
- Headphone minijack
- Support for Apple Earphones with Remote and Mic

## Communications

AirPort Extreme Wi-Fi wireless networking<sup>4</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible

Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology

Apple USB Ethernet Adapter (sold separately)

## Battery and power<sup>5</sup>

Built-in 50-watt-hour lithium-polymer battery

45W MagSafe power adapter with cable management system

MagSafe power port

- Up to 7 hrs  
wireless productivity
- Up to 30 days  
standby time

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

- 13-inch MacBook Air
- 45W MagSafe power adapter, AC wall plug, and power cord
- Printed and electronic documentation
- Software Reinstall Drive

## Included software

### Mac OS X Snow Leopard

Includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, and more.

### iLife

Includes iPhoto, iMovie, GarageBand, iWeb, and iDVD.

## DVD or CD Sharing

Without a built-in optical drive, how do you install new applications? Simply use DVD or CD Sharing. This convenient feature of Mac OS X lets you wirelessly “borrow” the optical drive of a nearby Mac or PC. So you can install applications from a DVD or CD and have full access to an optical drive without having to carry one around.

## Configurations

	13-inch MacBook Air (MC503LL/A)	13-inch MacBook Air (MC504LL/A)
<b>Enclosure</b>	Precision aluminum unibody	
<b>Processor</b>	1.86GHz Intel Core 2 Duo	
<b>L2 cache</b>	6MB shared	
<b>System bus</b>	1066MHz	
<b>Memory</b>	2GB of 1066MHz DDR3 SDRAM onboard (4GB maximum)	
<b>Storage<sup>2</sup></b>	128GB of flash storage	256GB of flash storage
<b>Slot-loading optical drive</b>	Optional external USB MacBook Air SuperDrive (sold separately)	
<b>Graphics</b>	NVIDIA GeForce 320M graphics processor with 256MB of DDR3 SDRAM shared with main memory <sup>3</sup>	
<b>Video</b>	FaceTime camera; Mini DisplayPort output port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)	
<b>Display</b>	13.3-inch (diagonal) high-resolution LED-backlit glossy widescreen display, 1440-by-900 resolution	
<b>Ports</b>	Two USB 2.0 ports (up to 480 Mbps); SD card slot	
<b>Audio</b>	Stereo speakers, omnidirectional microphone, headphone minijack	
<b>Networking</b>	Apple USB Ethernet Adapter (sold separately)	
<b>Wireless</b>	AirPort Extreme Wi-Fi (based on IEEE 802.11n specification) <sup>4</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology	
<b>Hardware accessories</b>	45W MagSafe Power Adapter, AC wall plug, power cord	

	13-inch MacBook Air (MC503LL/A)	13-inch MacBook Air (MC504LL/A)
<b>Limited warranty and service</b>	Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
<b>Apple and the global environment</b>	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
<b>Recycling</b>	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Accessories

### MacBook Air SuperDrive

Play or burn discs directly with the external USB-based MacBook Air SuperDrive. Thin, light, and easy to take with you, this drive is designed specifically for MacBook Air.

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Size: 139 x 139 x 17 mm / 5.47 x 5.47 x 0.67 inches (L x W x H)
- Weight: 335 g (0.74 pound)
- Requires MacBook Air with available USB 2.0 port

### MagSafe Airline Adapter

Plug into your airline seat power port and keep MacBook Air powered up for the entire flight.

### Connect your MacBook Air to an external display or projector using one of these adapters.

Mini DisplayPort to DVI Adapter

Mini DisplayPort to Dual-Link DVI Adapter

Mini DisplayPort to VGA Adapter

### Time Capsule

### AirPort Extreme Base Station

### AirPort Express Base Station

### Apple Wireless Keyboard

### Magic Mouse

### AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. 1GB=1 billion bytes; actual formatted capacity less.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  5. Testing conducted by Apple in September 2010 using preproduction 1.86GHz Intel Core 2 Duo-based 13-inch MacBook Air units and preproduction 1.4GHz Intel Core 2 Duo-based 11-inch MacBook Air units. The wireless productivity test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Standby testing conducted by Apple in September 2010 using preproduction 1.86GHz and 2.13GHz Intel Core 2 Duo-based 13-inch MacBook Air units as well as preproduction 1.4GHz and 1.6GHz Intel Core 2 Duo-based 11-inch MacBook Air units. The standby test measures battery life by allowing a system, connected to a wireless network, to enter deep sleep mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  6. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, Venezuela, and other regions where agency approvals are given.
  7. MacBook Air achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.





# MacBook Pro (13-inch, Early 2011) - Technical Specifications

## Size and weight

- Height: 0.95 inch (2.41 cm)
- Width: 12.78 inches (32.5 cm)
- Depth: 8.94 inches (22.7 cm)
- Weight: 4.5 pounds (2.04 kg)<sup>1</sup>

## Connections and expansion



- MagSafe power port
- Gigabit Ethernet port
- FireWire 800 port (up to 800 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)
- Thunderbolt port (up to 10 Gbps)
- Audio in/out
- SDXC card slot
- Kensington lock slot

## Communications

- Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Stereo speakers with subwoofer
- Omnidirectional microphone
- Combined headphone/line in (supports digital output)
- Support for Apple iPhone headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Energy Efficient Ethernet
- Reduced packaging volume
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>4</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	2.3 GHz	2.7 GHz	2.3 GHz	2.7 GHz
Idle	2.7	2.7	17	16
Hard drive accessing	2.7	2.7	16	14
CD drive accessing	3.4	no value	26	no value

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).

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2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

- Intel HD Graphics 3000 with 384MB of DDR3 SDRAM shared with main memory<sup>5</sup>
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- FaceTime HD camera
- Thunderbolt port

## Thunderbolt digital video output

- Native Mini DisplayPort output
- DVI output using Mini DisplayPort to DVI Adapter (optional)
- VGA output using Mini DisplayPort to VGA Adapter (optional)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)
- HDMI audio and video output using a third-party Mini DisplayPort to HDMI Adapter

## Input

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.3GHz dual-core Intel Core i5 processor with 3MB shared L3 cache or 2.7GHz dual-core Intel Core i7 processor with 4MB shared L3 cache
- 4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 memory; two SO-DIMM slots support up to 8GB

## Storage

- 320GB or 500GB 5400-rpm Serial ATA hard drive; optional 500GB 5400-rpm hard drive or 128GB, 256GB, or 512GB solid-state drive<sup>6</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>7</sup>

- Up to **7 hrs** wireless web
- Built-in 63.5-watt-hour lithium-polymer battery
- 60W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

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## What's in the box

- MacBook Pro
- Display cleaning cloth
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Software DVDs
- Printed and electronic documentation

## Software

- Mac OS X v10.6 Snow Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## 13-inch Configurations

	2.3GHz MacBook Pro (MC700LL/A)	2.7GHz MacBook Pro (MC724LL/A)
Enclosure	Precision aluminum unibody	
Processor	2.3GHz dual-core Intel Core i5	2.7GHz dual-core Intel Core i7
L3 cache	3MB shared	4MB shared
Memory	4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 SDRAM; supports up to 8GB	
Hard drive <sup>6</sup>	320GB Serial ATA; 5400 rpm	500GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
Graphics	Intel HD Graphics 3000 processor with 384MB of DDR3 SDRAM shared with main memory <sup>5</sup>	
Video	FaceTime HD camera; Thunderbolt port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)	
Display	13.3-inch (diagonal) LED-backlit glossy widescreen display, 1280-by-800 resolution	
Expansion	One Thunderbolt port (up to 10 Gbps), one FireWire 800 port (up to 800 Mbps), two USB 2.0 ports (up to 480 Mbps), SDXC card slot	
Audio	Stereo speakers with subwoofer, omnidirectional microphone, combined headphone/line in (supports digital output)	
Networking	10/100/1000BASE-T (Gigabit) Ethernet	
Wireless	Wi-Fi (based on IEEE 802.11n specification) <sup>2</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology	
Hardware accessories	60W MagSafe Power Adapter, AC wall plug, power cord	
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
Apple and the global environment	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 1TB or 2TB server-grade hard drive
- Wi-Fi Certified for 802.11n 2.0
- USB port for connecting a USB printer or USB external hard drive

### Configure to order

- 500GB (5400-rpm) hard drive
- 750GB (5400-rpm) hard drive
- 128GB, 256GB, or 512GB solid-state drive

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- Up to 8GB of 1333MHz DDR3 SDRAM
- Apple Remote
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan
- Aperture
- Final Cut Express
- Logic Express
- iWork

## Accessories

- Apple LED Cinema Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Magic Mouse
- Apple Keyboard with Numeric Keypad
- Apple Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.
  5. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 384MB.
  6. 1GB=1 billion bytes; actual formatted capacity less.
  7. Wireless web testing conducted by Apple in February 2011 using preproduction 2.7GHz dual-core Intel Core i7–based 13-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

Published Date: Aug 11, 2011

# iBook (Opaque 16 VRAM), (32 VRAM), (14.1 LCD 32 VRAM) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iBook (Opaque 16 VRAM), (32 VRAM), (14.1 LCD 32 VRAM) - Technical Specifications

Available Configurations			
Order no.	M8860LL/A	M8861LL/A	M8862LL/A
Processor	700MHz PowerPC G3	800MHz PowerPC G3	800MHz PowerPC G3
Level 2 Cache	512K at 700MHz	512K at 800MHz	512K at 800MHz
System bus	100MHz	100MHz	100MHz
Memory (PC100 SDRAM)	128MB, supports up to 640MB	128MB, supports up to 640MB	256MB, supports up to 640MB
Hard disk drive <sup>(2)</sup>	20GB Ultra ATA	30GB Ultra ATA	30GB Ultra ATA
Optical drive	CD-ROM	Combo (DVD-ROM/CD-RW)	Combo (DVD-ROM/CD-RW)
Display	12.1-inch (diagonal) TFT XGA	12.1-inch (diagonal) TFT XGA	14.1-inch (diagonal) TFT XGA
Graphics support	ATI Mobility Radeon 7500 with 16MB VRAM		
FireWire	One 400-Mbps FireWire (IEEE 1394) port		
USB	Two ports (12-Mbps each)		
VGA, S-video and composite video output	Video output for mirroring with an external display or projector [requires included VGA video adapter]; S-video and composite video output to TV through Video output port (requires optional Apple Video Adapter, sold separately).		
Modem <sup>(4)</sup>	Built-in 56K V.92 modem		
Ethernet	Built-in 10/100BASE-T Ethernet		
Wireless networking <sup>(5)</sup>	AirPort ready		
System Software	Mac OS X, Mac OS 9		
Software	All models include Mac OS X, Mac OS 9, QuickTime, iCal, iChat, iMovie, iPhoto, iTunes, DVD Player, AppleWorks, Mac OS X Mail, Microsoft Internet Explorer, EarthLink (includes 30 days of free service), AOL, Quicken 2003 Deluxe, World Book 2003 Edition, Mac OS X Chess, Otto Matic, Deimos Rising, FAXstf, PixelNhance, and Acrobat Reader; Apple Hardware Test CD		
Internet Access	All models also include 30 days of free Internet service through EarthLink. Internet access requires an Internet service account; fees may apply. Product contains documentation. Backup copy of software is provided on CD-ROM		
Build-to-Order Options	In addition to choosing from Apple’s preconfigured systems, you can order an iBook with factory-installed options such as additional RAM, a larger hard drive, and AirPort wireless networking from your authorized Apple reseller or the online Apple Store. For up-to-date information, visit the <a href="#">Apple Store</a> or call 800-MY-APPLE.		

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

Other Options	
Apple Portable Power Adapter <a href="#">M8943LL/A</a>	AirPort Card M7600LL/D
iBook Rechargeable Battery (12.1-inch iBook with CD-ROM) M8956G/A	AirPort Base Station M8209LL/A
iBook Rechargeable Battery (12.1-inch iBook with Combo) M8433G/A	iPod (5GB) M8513LL/B
iBook Rechargeable Battery (14.1-inch iBook) M8665G/A	iPod (10GB) M8737LL/A
Apple Video Adapter M8734G/A	iPod (20GB) M8738LL/A
Apple VGA Display Adaptor <a href="#">M8639G/A</a>	Apple FireWire Cable (4-pin to 6-pin, 2 meter) M8635G/A
AppleCare Protection Plan <a href="#">M8852LL/A</a>	Apple FireWire Cable (6-pin to 6-pin, 2 meter) M8634G/B
.Mac subscription: Retail Box <a href="#">MA175Z/A</a> or Family Pack <a href="#">MA176Z/A</a>	Apple FireWire Cable (6-pin to 6-pin, .5 meter) M8633G/B
D-Link DWB-120M USB Bluetooth Adapter <a href="#">T6295ZM/A</a>	

Technical Specifications

Processor and memory

- ▮ 700MHz or 800MHz PowerPC G3 processor with 512K on-chip level 2 cache running at full processor speed
- ▮ 100 MHZ system bus
- ▮ One of the following memory configurations:
  - 128MB of SDRAM built in
  - 256MB of SDRAM (128MB built in and 128MB in SO-DIMM slot)
- ▮ Single 1.25-inch standard SO-DIMM slot (3.3V) supports up to 512MB SO-DIMM for a total of 640MB of SDRAM

Storage

- ▮ 20GB or 30GB Ultra ATA hard disk drive (2)
- ▮ One of the following optical drives:
  - 24x-speed (maximum) CD-ROM drive
  - 16x8x8x24x-speed (maximum) Combo drive (DVD-ROM/CD-RW); writes CD-R discs at 16x speed, writes CD-RW discs at 8x speed, reads DVD-ROM discs at 8x speed, reads CD-ROM discs at 24x speed
- ▮ Support for external FireWire and USB storage devices

Power adapter

The iBook comes with a convenient square-shaped power adapter that fits in your hand. The adapter has retractable hooks that let you wrap the DC cord for neater storage. The AC cord lets you connect your iBook to an outlet up to 12 feet away, and you can also remove the cord and use the included AC plug to connect the adapter directly into the wall. Colored status LED lights show charging status. An amber ring indicates that your battery is recharging, while a green ring tells you that you have a full charge.

Display

- ▮ Choice of built-in 12.1-inch or 14.1-inch (diagonal) TFT XGA active-matrix display
- ▮ Support for millions of colors at 1024-by-768-pixel resolution
- ▮ Support for resolution scaling to 800-by-600-pixel and 640-by-480-pixel resolution with millions of colors

Graphics support

- ▮ ATI Mobility Radeon 7500 graphics accelerator with 16MB or 32MB of dedicated video memory and AGP 2X support

Communications

- ▮ Built-in 56K V.92 modem (RJ-11 connector) (4)
- ▮ Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- ▮ Built-in antennas and expansion slot for optional 11-Mbps AirPort Card; IEEE 802.11b compliant (5)

Audio

- ▮ 16-bit CD-quality stereo sound output minijack
- ▮ Built-in stereo speakers
- ▮ Built-in microphone
- ▮ Support for external USB audio devices such as microphones and speakers

Video

- ▮ VGA video output for video mirroring on an external display or projector (24-bit color) with included VGA display adapter
- ▮ S-video and composite video output to TV or projector (requires Apple Video Adapter, sold separately)

Peripheral connections

- ▮ Two 12-Mbps USB ports
- ▮ One 400-Mbps FireWire (IEEE 1394) port (6)

Keyboard and trackpad

- ▮ Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement) and embedded keypad
- ▮ Solid-state trackpad for precise cursor control; supports tap, double-tap, and drag capabilities

Battery

- ▮ iBook with 12.1-inch display: 47-watt-hour lithium-ion battery provides up to 5 hours of battery life on a single charge (3)
- ▮ iBook with 14.1-inch display: 55-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge (3)
- ▮ Integrated charge indicator LEDs on battery

Electrical and environmental requirements

- ▮ Meets ENERGY STAR requirements
- ▮ Line voltage: 100V to 240V AC
- ▮ Frequency: 50 to 60 Hz
- ▮ Operating temperature: 50° to 95° F (10° to 35° C)
- ▮ Storage temperature: -13° to 140° F (-25° to 60° C)
- ▮ Relative humidity: 20% to 80% noncondensing
- ▮ Maximum operating altitude: 10,000 feet
- ▮ Maximum storage altitude: 15,000 feet

Size and weight: iBook with 12.1-inch display

- ▮ Height: 1.35 inches (3.4 cm)
- ▮ Width: 11.2 inches (28.5 cm)
- ▮ Depth: 9.06 inches (23.0 cm)
- ▮ Weight: 4.9 pounds (2.2 kg) (1)

Size and weight: iBook with 14.1-inch display

- ▮ Height: 1.35 inches (3.4 cm)
- ▮ Width: 12.7 inches (32.3 cm)
- ▮ Depth: 10.2 inches (25.9 cm)
- ▮ Weight: 5.9 pounds (2.7 kg) (1)

(1) Weight varies by configuration and manufacturing process.  
(2) 1GB = 1 billion bytes; actual formatted capacity less.  
(3) Battery life depends on configuration and use.  
(4) Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.  
(5) Wireless Internet access requires AirPort Card, AirPort Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.  
(6) Actual rates will vary.  
(7) CD burning requires CD-RW drive. iTunes is for legal or rightholder-authorized copying only. Don't steal music.  
Product specifications are subject to change without notice.

# MacBook Pro (15-inch, Early 2011) - Technical Specifications

## Size and weight

- Height: 0.95 inch (2.41 cm)
- Width: 14.35 inches (36.4 cm)
- Depth: 9.82 inches (24.9 cm)
- Weight: 5.6 pounds (2.54 kg)<sup>1</sup>

## Connections and expansion



- MagSafe power port
- Gigabit Ethernet port
- FireWire 800 port (up to 800 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)
- Thunderbolt port (up to 10 Gbps)
- Audio line in
- Audio line out
- SDXC card slot
- Kensington lock slot

## Communications

- Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Stereo speakers with subwoofers
- Omidirectional microphone (located under left speaker grille)
- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- Support for Apple iPhone headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Energy Efficient Ethernet
- Reduced packaging volume
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>4</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	2.0 GHz	2.2 GHz	2.0 GHz	2.2 GHz
Idle	2.9	3.0	20	19
Hard drive accessing	2.9	3.0	20	20
CD drive accessing	3.4	3.5	30	26



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1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

- Glossy
- Antiglare
- 15.4-inch (diagonal) LED-backlit glossy or optional antiglare widescreen display with support for millions of colors
- **Supported resolutions:** 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

- AMD Radeon HD 6490M graphics processor with 256MB of GDDR5 memory on 2.0GHz configuration; or AMD Radeon HD 6750M graphics processor with 1GB of GDDR5 memory on 2.2GHz configuration
- Intel HD Graphics 3000 with 384MB of DDR3 SDRAM shared with main memory<sup>5</sup>
- Automatic graphics switching
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- FaceTime HD camera
- Thunderbolt port

## Thunderbolt digital video output

- Native Mini DisplayPort output
- DVI output using Mini DisplayPort to DVI Adapter (optional)
- VGA output using Mini DisplayPort to VGA Adapter (optional)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)
- HDMI audio and video output using a third-party Mini DisplayPort to HDMI Adapter

## Input

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.0GHz or 2.2GHz quad-core Intel Core i7 processor with 6MB shared L3 cache; or optional 2.3GHz quad-core Intel Core i7 processor with 8MB shared L3 cache
- 4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 memory; two SO-DIMM slots support up to 8GB

## Storage

- 500GB or 750GB 5400-rpm Serial ATA hard drive; optional 750GB 5400-rpm hard drive, 500GB 7200-rpm hard drive, or 128GB, 256GB, or 512GB solid-state drive<sup>6</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>7</sup>

- Up to **7 hrs** wireless web
- Built-in 77.5-watt-hour lithium-polymer battery
- 85W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)

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- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

- MacBook Pro
- Display cleaning cloth
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Software DVDs
- Printed and electronic documentation

## Software

- Mac OS X v10.6 Snow Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## 15-inch Configurations

	2.0GHz MacBook Pro (MC721LL/A)	2.2GHz MacBook Pro (MC723LL/A)
Enclosure	Precision aluminum unibody	
Processor	2.0GHz quad-core Intel Core i7	2.2GHz quad-core Intel Core i7
L3 cache	6MB shared	6MB shared
Memory	4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 SDRAM; supports up to 8GB	
Hard drive <sup>6</sup>	500GB Serial ATA; 5400 rpm	750GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
Graphics	Intel HD Graphics 3000 <sup>5</sup> and AMD Radeon HD 6490M with automatic graphics switching	Intel HD Graphics 3000 <sup>5</sup> and AMD Radeon HD 6750M with automatic graphics switching
Graphics memory	256MB GDDR5	1GB GDDR5
Video	FaceTime HD camera; Thunderbolt port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)	
Display	15.4-inch (diagonal) LED-backlit glossy widescreen display, 1440-by-900 resolution	
Expansion	One Thunderbolt port (up to 10 Gbps), one FireWire 800 port (up to 800 Mbps), two USB 2.0 ports (up to 480 Mbps), SDXC card slot	
Audio	Stereo speakers with subwoofers, omnidirectional microphone, audio line in minijack (digital/analog), audio line out/headphone minijack (digital/analog)	
Networking	10/100/1000BASE-T (Gigabit) Ethernet	
Wireless	Wi-Fi (based on IEEE 802.11n specification) <sup>2</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology	
Hardware accessories	85W MagSafe Power Adapter, AC wall plug, power cord	
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	
Apple and the global environment	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.	
Recycling	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.	

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

# 620\_MacBook Pro (15-inch, Early 2011) - Technical Specifications.pdf

- 1TB or 2TB server-grade hard drive
- Wi-Fi Certified for 802.11n 2.0
- USB port for connecting a USB printer or USB external hard drive

## Configure to order

- 750GB (5400-rpm) hard drive
- 500GB (7200-rpm) hard drive
- 128GB, 256GB, or 512GB solid-state drive
- Up to 8GB of 1333MHz DDR3 SDRAM
- 1680-by-1050 high-resolution glossy display
- 1680-by-1050 high-resolution antiglare display
- Apple Remote
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan
- Aperture
- Final Cut Express
- Logic Express
- iWork

## Accessories

- Apple LED Cinema Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Magic Mouse
- Apple Keyboard with Numeric Keypad
- Apple Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.
  5. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 384MB.
  6. 1GB=1 billion bytes; actual formatted capacity less.
  7. Wireless web testing conducted by Apple in February 2011 using preproduction 2.2GHz quad-core Intel Core i7-based 15-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

Published Date: Aug 11, 2011

# MacBook Pro (17-inch, Early 2011) - Technical Specifications

## Size and weight

- Height: 0.98 inch (2.50 cm)
- Width: 15.47 inches (39.3 cm)
- Depth: 10.51 inches (26.7 cm)
- Weight: 6.6 pounds (2.99 kg)<sup>1</sup>

## Connections and expansion



- MagSafe power port
- Gigabit Ethernet port
- FireWire 800 port (up to 800 Mbps)
- Three USB 2.0 ports (up to 480 Mbps)
- Thunderbolt port (up to 10 Gbps)
- Audio line in
- Audio line out
- ExpressCard/34 slot
- Kensington lock slot

## Communications

- Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Stereo speakers with subwoofers
- Omnidirectional microphone (located under left speaker grille)
- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- Support for Apple iPhone headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Energy Efficient Ethernet
- Reduced packaging volume
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>4</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB	Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)
Idle	3.0	17
Hard drive accessing	3.0	17
CD drive accessing	no value	no value

# 621\_MacBook Pro (17-inch, Early 2011) - Technical Specifications.pdf

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Display

- Glossy
- Antiglare
- 17-inch (diagonal) high-resolution LED-backlit glossy or optional antiglare widescreen display with support for millions of colors
- **Supported resolutions:** 1920 by 1200 (native), 1680 by 1050, 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio stretched; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

- AMD Radeon HD 6750M graphics processor with 1GB of GDDR5 memory
- Intel HD Graphics 3000 with 384MB of DDR3 SDRAM shared with main memory<sup>5</sup>
- Automatic graphics switching
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- FaceTime HD camera
- Thunderbolt port

## Thunderbolt digital video output

- Native Mini DisplayPort output
- DVI output using Mini DisplayPort to DVI Adapter (optional)
- VGA output using Mini DisplayPort to VGA Adapter (optional)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)
- HDMI audio and video output using a third-party Mini DisplayPort to HDMI Adapter

## Input

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.2GHz quad-core Intel Core i7 processor with 6MB shared L3 cache; or optional 2.3GHz quad-core Intel Core i7 processor with 8MB shared L3 cache
- 4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 memory; two SO-DIMM slots support up to 8GB

## Storage

- 750GB 5400-rpm Serial ATA hard drive; optional 500GB 7200-rpm hard drive or 128GB, 256GB, or 512GB solid-state drive<sup>6</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>7</sup>

- Up to **7 hrs** wireless web
- Built-in 95-watt-hour lithium-polymer battery
- 85W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F

# 621\_MacBook Pro (17-inch, Early 2011) - Technical Specifications.pdf

(-24° to 45° C)

- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## What's in the box

- MacBook Pro
- Display cleaning cloth
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Software DVDs
- Printed and electronic documentation

## Software

- Mac OS X v10.6 Snow Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## 17-inch Configuration

	<b>2.2GHz MacBook Pro (MC725LL/A)</b>
<b>Enclosure</b>	Precision aluminum unibody
<b>Processor</b>	2.2GHz quad-core Intel Core i7
<b>L3 cache</b>	6MB shared
<b>Memory</b>	4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 SDRAM; supports up to 8GB
<b>Hard drive<sup>6</sup></b>	750GB Serial ATA; 5400 rpm
<b>Slot-loading optical drive</b>	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
<b>Graphics</b>	Intel HD Graphics 3000 <sup>5</sup> and AMD Radeon HD 6750M with automatic graphics switching
<b>Graphics memory</b>	1GB GDDR5
<b>Video</b>	FaceTime HD camera; Thunderbolt port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)
<b>Display</b>	17-inch (diagonal) high-resolution LED-backlit glossy or optional antiglare widescreen display, 1920-by-1200 resolution
<b>Expansion</b>	One Thunderbolt port (up to 10 Gbps), one FireWire 800 port (up to 800 Mbps), three USB 2.0 ports (up to 480 Mbps), ExpressCard/34 slot
<b>Audio</b>	Stereo speakers with subwoofers, omnidirectional microphone, audio line in minijack (digital/analog), audio line out/headphone minijack (digital/analog)
<b>Networking</b>	10/100/1000BASE-T (Gigabit) Ethernet
<b>Wireless</b>	Wi-Fi (based on IEEE 802.11n specification) <sup>2</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
<b>Hardware accessories</b>	85W MagSafe Power Adapter, AC wall plug, power cord
<b>Limited warranty and service</b>	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.
<b>Apple and the global environment</b>	Learn more about Apple's dedication to reducing the environmental impact of our products and processes. The Apple Product Environmental Specification details the environmental attributes of our products.
<b>Recycling</b>	Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.

## Options

### Time Capsule

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 1TB or 2TB server-grade hard drive

# 621\_MacBook Pro (17-inch, Early 2011) - Technical Specifications.pdf

- Wi-Fi Certified for 802.11n 2.0
- USB port for connecting a USB printer or USB external hard drive

## Configure to order

- 2.3GHz quad-core Intel Core i7 processor
- 500GB (7200-rpm) hard drive
- 128GB, 256GB, or 512GB solid-state drive
- Up to 8GB of 1333MHz DDR3 SDRAM
- Antiglare display
- Apple Remote
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan
- Aperture
- Final Cut Express
- Logic Express
- iWork

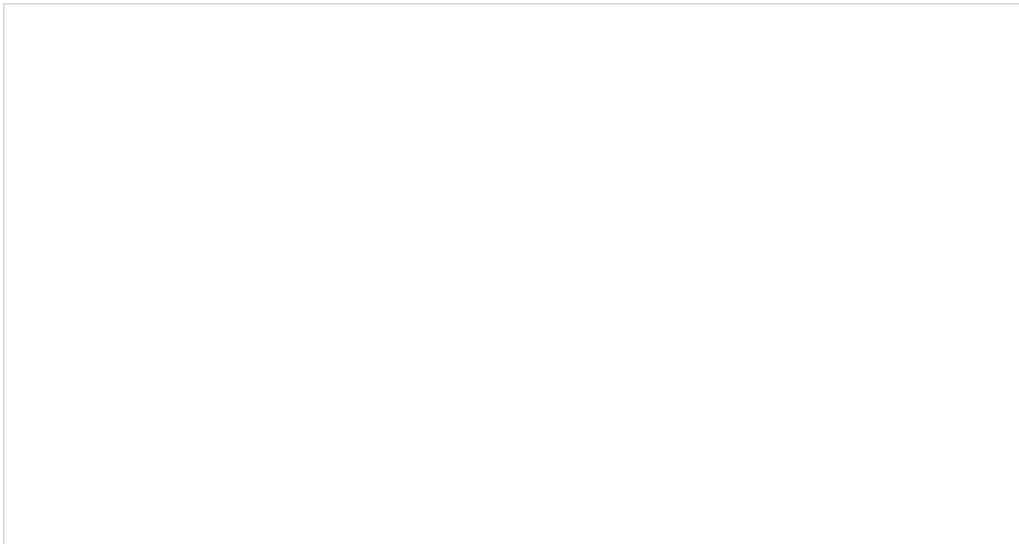
## Accessories

- Apple LED Cinema Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Magic Mouse
- Apple Keyboard with Numeric Keypad
- Apple Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.
  5. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 384MB.
  6. 1GB=1 billion bytes; actual formatted capacity less.
  7. Wireless web testing conducted by Apple in February 2011 using preproduction 2.2GHz quad-core Intel Core i7-based 17-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

Published Date: Aug 11, 2011

# iPad 2 - Technical Specifications



## Models

- Wi-Fi
- Wi-Fi + 3G

## Size and Weight<sup>1</sup>

### Wi-Fi

- Height: 9.50 inches (241.2 mm)
- Width: 7.31 inches (185.7 mm)
- Depth: 0.34 inch (8.8 mm)
- Weight: 1.33 pounds (601 g)

### Wi-Fi + 3G

- Height: 9.50 inches (241.2 mm)
- Width: 7.31 inches (185.7 mm)
- Depth: 0.34 inch (8.8 mm)
- Weight: 1.35 pounds (613 g)  
(Wi-Fi + 3G model)
- Weight: 1.34 pounds (607 g)  
(Wi-Fi + 3G for Verizon model)

## Storage<sup>2</sup>

- 16GB

## Wireless and Cellular

### Wi-Fi

- Wi-Fi (802.11a/b/g/n)
- Bluetooth 2.1 + EDR technology

### Wi-Fi + 3G

- Wi-Fi + 3G model: UMTS/HSDPA/HSUPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
- Wi-Fi + 3G for Verizon model: CDMA EV-DO Rev. A (800, 1900 MHz)
- Data only<sup>3</sup>
- Wi-Fi (802.11a/b/g/n)
- Bluetooth 2.1 + EDR technology



## Carriers

### Wi-Fi + 3G

- AT&T
- Verizon

## Display

- 9.7-inch (diagonal) LED-backlit glossy widescreen Multi-Touch display with IPS technology
- 1024-by-768-pixel resolution at 132 pixels per inch (ppi)
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously

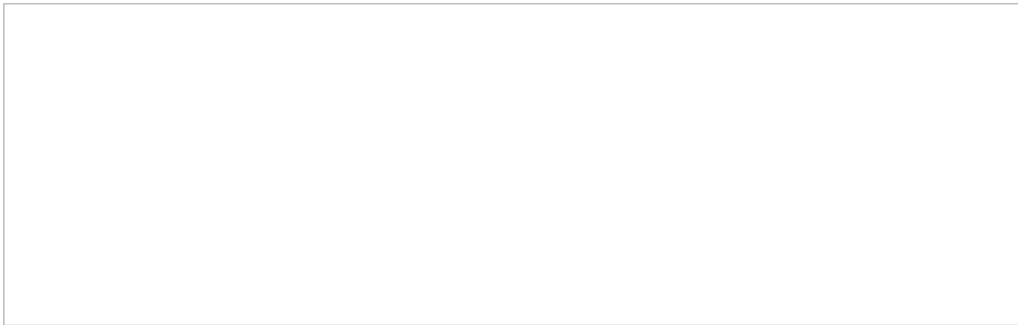
## Chip

- 1GHz dual-core Apple A5 custom-designed, high-performance, low-power system-on-a-chip

## Cameras, Photos, and Video Recording

- Back camera: Video recording, HD (720p) up to 30 frames per second with audio; still camera with 5x digital zoom
- Front camera: Video recording, VGA up to 30 frames per second with audio; VGA-quality still camera
- Tap to control exposure for video or stills
- Photo and video geotagging over Wi-Fi

## External Buttons and Connectors



## Power and Battery<sup>4</sup>

### Wi-Fi

- Built-in 25-watt-hour rechargeable lithium-polymer battery
- Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
- Charging via power adapter or USB to computer system

### Wi-Fi + 3G

- Built-in 25-watt-hour rechargeable lithium-polymer battery
- Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
- Up to 9 hours of surfing the web using 3G data network
- Charging via power adapter or USB to computer system

## Input/Output

### Wi-Fi

- 30-pin dock connector port
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Microphone

## Wi-Fi + 3G

- 30-pin dock connector port
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Micro-SIM card tray (Wi-Fi + 3G model)
- Microphone

## Sensors

- Accelerometer
- Ambient light sensor
- Gyroscope

## Location

### Wi-Fi

- Wi-Fi
- Digital compass

### Wi-Fi + 3G

- Wi-Fi
- Digital compass
- Assisted GPS
- Cellular

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: HE-AAC (V1 and V2), AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit
- Dolby Digital 5.1 surround sound pass-through with Apple Digital AV Adapter (sold separately)

## TV and Video

- AirPlay Mirroring to Apple TV support at 720p
- Video mirroring and video out support: Up to 1080p with Apple Digital AV Adapter or Apple VGA Adapter (adapters sold separately)
- Video out support at 576p and 480p with Apple Component AV Cable; 576i and 480i with Apple Composite AV Cable (cables sold separately)
- Video formats supported: H.264 video up to 1080p, 30 frames per second, High Profile level 4.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

Viewable document types: .jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel)

## Languages

- Language support for English (U.S.), English (UK), French (France), German, Traditional Chinese, Simplified Chinese, Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese, Russian, Polish, Turkish, Ukrainian, Hungarian, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, Croatian, Catalan, and Vietnamese
- Keyboard support for English (U.S.), English (UK), French (France), French (Canadian), French (Switzerland), German, Traditional Chinese (Handwriting, Pinyin, Zhuyin, Cangjie, Wubihua), Simplified Chinese (Handwriting, Pinyin, Wubihua), Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese (Romaji, Ten Key), Japanese (Kana), Russian, Polish, Turkish, Ukrainian, Estonian, Hungarian, Icelandic, Lithuanian, Latvian, Flemish, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malay, Romanian, Slovak, Croatian, Bulgarian, Serbian (Cyrillic/Latin), Catalan, Vietnamese, Tibetan, Macedonian, and

Cherokee

- Dictionary support (enables predictive text and autocorrect) for English (U.S.), English (UK), French, German, Traditional Chinese, Simplified Chinese, Dutch, Italian, Spanish, Portuguese (Brazil), Portuguese (Portugal), Danish, Swedish, Finnish, Norwegian, Korean, Japanese (Romaji), Japanese (Kana), Russian, Polish, Turkish, Ukrainian, Hungarian, Lithuanian, Flemish, Arabic, Thai, Czech, Greek, Hebrew, Indonesian, Malaysian, Romanian, Slovak, Croatian, Catalan, Vietnamese, and Cherokee

## Accessibility

- VoiceOver screen reader
- Support for playback of closed-captioned content
- AssistiveTouch interface for adaptive accessories
- Full-screen zoom magnification
- Large fonts
- White on black display
- Left/right volume adjustment

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>5</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X v10.5.8 or later
  - PC: Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
  - iTunes 10.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## In the Box

- iPad
- Dock Connector to USB Cable
- 10W USB Power Adapter

## Built-in Apps

- Safari
- Photos
- App Store
- Maps
- Photo Booth
- Reminders
- Camera
- Mail
- FaceTime
- iTunes
- Music
- Clock
- Calendar
- Messages
- Newsstand
- Videos
- Game Center
- Contacts
- Notes

## iPad and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iPad embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:**

- Mercury-free LCD display
- Arsenic-free display glass
- BFR-free
- PVC-free
- Recyclable aluminum enclosure

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPad.

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1. Actual size and weight vary by configuration and manufacturing process.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. 3G data plan is sold separately. The iPad with Wi-Fi + 3G model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and 3G data plan availability.
4. Testing conducted by Apple in February 2012 using preproduction iPad units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique songs, consisting of a combination of songs imported from CDs using iTunes (128-Kbps AAC encoding) and songs purchased from the iTunes Store (256-Kbps AAC encoding). Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.
5. Wireless broadband recommended; fees may apply.

Published Date: Jun 14, 2013

# iMac (21.5-inch, Mid 2011) - Technical Specifications

## Display

- 21.5-inch (viewable) LED-backlit glossy widescreen TFT display with support for millions of colors
- Resolution: 1920 by 1080 pixels

## Processor

- 2.5GHz quad-core Intel Core i5 with 6MB on-chip shared L3 cache
- 2.7GHz quad-core Intel Core i5 with 6MB on-chip shared L3 cache  
*Configurable to 2.8GHz quad-core Intel Core i7, only at the Apple Online Store.*

## Memory

4GB (two 2GB) of 1333MHz DDR3 memory

*Configurable to 16GB, only at the Apple Online Store.*

## Storage<sup>1</sup>

- **2.5 GHz**  
500GB (7200 rpm) hard drive
- **2.7 GHz**  
1TB (7200 rpm) hard drive  
*Configurable to 2TB hard drive or 256GB solid-state second drive, only at the Apple Online Store.*

## Graphics

- **2.5 GHz**  
AMD Radeon HD 6750M graphics processor with 512MB of GDDR5 memory
- **2.7 GHz**  
AMD Radeon HD 6770M graphics processor with 512MB of GDDR5 memory

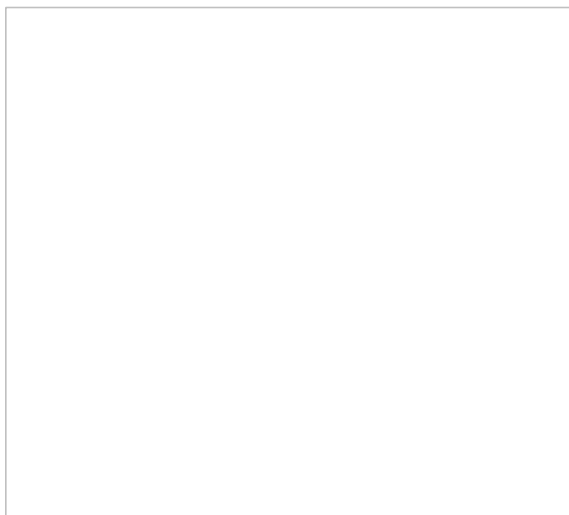
## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display
- Support for extended desktop and video mirroring modes

## Audio

- Built-in stereo speakers
- Two internal 17-watt high-efficiency amplifiers
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone
- Support for Apple iPhone headset with microphone

## Connections and Expansion



# 623\_iMac (21.5-inch, Mid 2011) - Technical Specifications.pdf

- One Thunderbolt port
- Mini DisplayPort output with support for DVI, VGA, and dual-link DVI (adapters sold separately)
- One FireWire 800 port; 7 watts
- Four USB 2.0 ports
- SDXC card slot
- Slot-loading 8x SuperDrive with 4x double-layer burning (DVD±R DL/DVD±RW/CD-RW)
- Audio in/out
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- IR receiver

## Input

- **Apple Wireless Keyboard**  
Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement), and embedded numeric keypad
- **Magic Mouse**  
Smooth, seamless Multi-Touch surface with support for simple gestures (scrolling and swiping). Click and double-click anywhere. Ambidextrous construction accommodates left- and right-handed users.
- **Magic Trackpad**  
Solid-state scrolling trackpad for precise cursor control; supports inertial scrolling, pinch and expand, swipe, three-finger swipe, four-finger swipe, tap, double-tap, rotate, screen zoom, scroll, click and drag, click drag and lock, secondary click A and B

## Wireless

- **Wi-Fi**  
802.11n Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g compatible
- **Bluetooth**  
Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology

## Size and Weight

- Height: 17.75 inches (45.1 cm)
- Width: 20.8 inches (52.8 cm)
- Depth: 7.42 inches (18.85 cm)
- Weight: 20.5 pounds (9.3 kg)<sup>3</sup>

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 205W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -4° to 116° F (-20° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- Typical acoustical performance
  - Sound pressure level (operator position): 18 dBA at idle<sup>4</sup>

## Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

## Environmental Status Report

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Mercury-free LED-backlit display
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>6</sup>

# 623\_iMac (21.5-inch, Mid 2011) - Technical Specifications.pdf

## Apple and the Global Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [The Apple Product Environmental Specification](#) details the environmental attributes of our products.

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	2.5 GHz	2.7 GHz	2.5 GHz	2.7 GHz
Idle	3.0	3.0	18	17
Hard drive accessing	3.0	3.0	19	17
CD drive accessing	3.3	3.2	22	20

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## In the Box

- iMac
- Apple Wireless Keyboard
- Apple Magic Mouse
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

## Included Software

### OS X Lion

Includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more.

### iLife

Includes iPhoto, iMovie, and GarageBand.

## Configurable Options

Purchase from the Apple Online Store to upgrade processor, graphics, memory, and hard drive, or to swap Magic Mouse for Magic Trackpad.

- **2.5 GHz**
  - Magic Trackpad
  - 8GB memory upgrade (two 4GB)
- **2.7 GHz**
  - Magic Trackpad
  - 8GB memory upgrade (two 4GB)
  - 16GB memory upgrade (four 4GB)
  - 2TB hard drive
  - 256GB solid-state second drive
  - 2.8GHz quad-core Intel Core i7

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Express
- Final Cut Express

# 623\_iMac (21.5-inch, Mid 2011) - Technical Specifications.pdf

## Displays and Graphics

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

## AirPort and Wireless

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station

## Other Accessories

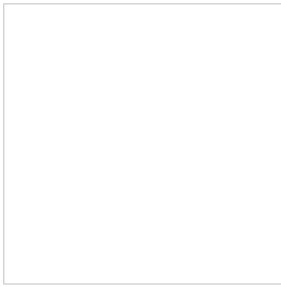
- Magic Trackpad
- Apple Battery Charger
- VESA Mount Adapter Kit
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. Weight varies by configuration and manufacturing process.
  4. Acoustics measured on standard 21.5-inch iMac systems. Acoustics may vary by configuration.
  5. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  6. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 17, 2013



# Final Cut Pro X - Technical Specifications



## Minimum System Requirements

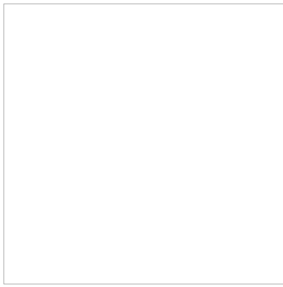
- macOS 10.13.2 or later
- 4GB of RAM (8GB recommended for 4K editing, 3D titles, and 360° video editing)
- [OpenCL-capable graphics card](#) or Intel HD Graphics 3000 or later
- 256MB of VRAM (1GB recommended for 4K editing, 3D titles, and 360° video editing)<sup>1</sup>
- Discrete graphics card, macOS High Sierra, and SteamVR required for VR headset support. AMD Radeon RX 580 graphics card recommended for best performance.
- 3.8GB of disk space

<https://www.apple.com/final-cut-pro/specs/>

- 
1. Performance of projects containing 3D text may be adversely affected on systems with less than 1GB of VRAM.

Published Date: Apr 5, 2018

# Motion 5 - Technical Specifications



## Minimum System Requirements

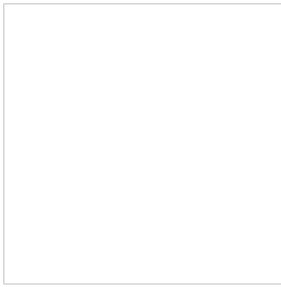
- macOS 10.13.2 or later
- 4GB of RAM (8GB recommended for 4K editing, 3D titles, and 360° video editing)
- [OpenCL-capable graphics card](#) or Intel HD Graphics 3000 or later
- 256MB of VRAM (1GB recommended for 4K editing, 3D titles, and 360° video editing)<sup>1</sup>
- 4.7GB of available disk space (3.5GB app, 1.2GB supplemental content)

<https://www.apple.com/final-cut-pro/motion/specs/>

- 
1. Performance of projects containing 3D text may be adversely affected on systems with less than 1GB of VRAM.

Published Date: Apr 23, 2018

# Compressor 4 - Technical Specifications



## Minimum System Requirements

- macOS 10.13.2 or later
- 4GB of RAM (8GB recommended for 4K editing, 3D titles, and 360° video editing)
- [OpenCL-capable graphics card](#) or Intel HD Graphics 3000 or later
- 256MB of VRAM (1GB recommended for 4K editing, 3D titles, and 360° video editing)<sup>1</sup>
- 1.2GB of available disk space

<https://www.apple.com/final-cut-pro/specs/>

- 
1. Performance of projects containing 3D text may be adversely affected on systems with less than 1GB of VRAM.

Published Date: Apr 5, 2018

# AirPort Time Capsule 802.11n (4th Generation) - Technical Specifications

## Size and weight

- Length: 7.7 inches (197 mm)
- Width: 7.7 inches (197 mm)
- Height: 1.4 inches (36.3 mm)
- Weight: 3.5 pounds (1.6 kg)<sup>1</sup>

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>2</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Electrical

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 34W

## Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268:2003, UL 60950, CSA-C22.2 No. 60950

## Storage

- 2TB or 3TB Serial ATA server-grade hard disk drive<sup>3</sup>

## Interfaces

- One Gigabit Ethernet WAN port for connecting a DSL or cable modem
- Three Gigabit Ethernet LAN ports for connecting computers or network devices
- USB port for connecting a USB printer or USB external hard drive
- 802.11n wireless

## Included in the box

- Time Capsule
- Power cord
- Printed documentation

## Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity (operational): 20% to 80% (noncondensing)
- Relative humidity (storage): 10% to 90%
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Wireless protocols

- IEEE 802.11a/b/g/n

## Compatibility

- Interoperable with Wi-Fi Certified 802.11a, 802.11b, 802.11g, or 802.11n enabled Mac computers, iPad, iPhone, iPod touch, and Windows-based PCs
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP, IPv6 (6to4 and manual tunnels)

Frequency bands

- 2.4GHz and 5GHz simultaneously

Radio output power

- 20 dBm (nominal)

Channels

- Channels 1-11, 36-48, and 149-165 approved for use in the United States and Canada
- Channels 1-13, 36-64, and 100-140 approved for use in Japan
- Channels 1-13, 36-64, 100-112, and 132-140 approved for use in Europe
- Channels 1-13, 36-64, and 149-165 approved for use in Australia, Hong Kong, and New Zealand

System Requirements

	For Mac Users	For PC Users
For backup using Time Machine	Mac computer with Mac OS X 10.5.7 or later	-
For setup and administration	Mac with Mac OS X v10.5.7 or later	PC with Windows XP (SP3), Windows Vista (SP2), or Windows 7 (SP1)
For wireless client access	Mac with AirPort wireless capability	PC with Wi-Fi Certified 802.11a/b/g/n card
For shared printing with a USB printer	USB printer; Mac with Mac OS X v10.2.7 or later	USB printer; PC with Windows XP (SP3), Windows Vista (SP2), or Windows 7(SP1)
For AirPort Disk with a USB hard drive	Mac with Mac OS X v10.4.8 or later	PC with Windows XP (SP3), Windows Vista (SP2), or Windows 7(SP1)

Extended service and support

The [AppleCare Protection Plan](#) for your computer covers Time Capsule.

- 
1. Weight varies by configuration and manufacturing process.
  2. Support for Wi-Fi Protected Access (WPA/WPA2) requires Mac OS X v10.3 or later or Windows XP with SP2 or later.
  3. 1TB = 1 trillion bytes; actual formatted capacity less.

Wi-Fi Protected Access is a mark of the Wi-Fi Alliance. Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Product specifications are subject to change without notice.

Published Date: Jul 12, 2013

# AirPort Extreme 802.11n (5th Generation) - Technical Specifications

## Size and weight

- Length: 6.5 inches (165 mm)
- Width: 6.5 inches (165 mm)
- Height: 1.3 inches (34 mm)
- Weight: 1.66 pounds (753 grams)<sup>1</sup>

## Wireless protocols

- IEEE 802.11a/b/g/n

## Frequency bands

- 2.4GHz and 5GHz simultaneously

## Radio output power

- 20 dBm (nominal)

## Compatibility

- Interoperable with Wi-Fi Certified 802.11a, 802.11b, 802.11g, or 802.11n enabled Mac computers, iPad, iPhone, iPod touch, and Windows-based PCs
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP, IPv6 (6to4 and manual tunnels)

## Included in the box

- AirPort Extreme Base Station
- Power supply with cord
- Printed documentation

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>2</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Interfaces

- One Gigabit Ethernet WAN port for connecting a DSL or cable modem
- Three Gigabit Ethernet LAN ports for connecting computers or network devices
- USB 2.0 port for connecting a USB printer or USB external hard drive
- 802.11n wireless

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity (operational): 20% to 80%
- Relative humidity (storage): 10% to 90%
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268: 2003, UL 60950, CSA-C22.2 No. 60950

## Channels

# 628\_AirPort Extreme 802.11n (5th Generation) - Technical Specifications.pdf

- Channels 1-11, 36-48, and 149-165 approved for use in the United States and Canada
- Channels 1-13, 36-64, and 100-140 approved for use in Japan
- Channels 1-13, 36-64, 100-112, and 132-140 approved for use in Europe
- Channels 1-13, 36-64, and 149-165 approved for use in Australia, Hong Kong, and New Zealand

## Electrical

- 12Vdc, 1.8A

## System Requirements

	For Mac Users	For PC Users
For setup and administration	Mac with Mac OS X 10.5.7 or later	PC with Windows XP (SP3), Windows Vista (SP2), or Windows 7 (SP1)
For wireless client access	Mac with AirPort wireless capability	PC with Wi-Fi Certified 802.11a/b/g/n card
For shared printing with a USB printer	<ul style="list-style-type: none"><li>• USB printer</li><li>• Mac with Mac OS X v10.2.7 or later</li></ul>	<ul style="list-style-type: none"><li>• USB printer</li><li>• PC with Windows XP (SP3), Windows Vista (SP2), or Windows 7 (SP1)</li></ul>
For AirPort Disk with a USB hard drive	Mac with Mac OS X v10.4.8 or later	PC with Windows XP (SP3), Windows Vista (SP2) or Windows 7 (SP1)

## Extended service and support

The [AppleCare Protection Plan](#) for your computer covers the AirPort Extreme Base Station.

- 
1. Weight varies by configuration and manufacturing process.
  2. Support for Wi-Fi Protected Access (WPA/WPA2) requires Mac OS X v10.3 or later or Windows XP with SP2 or later.

Wi-Fi Protected Access is a mark of the Wi-Fi Alliance. Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Product specifications are subject to change without notice.

Published Date: Jun 5, 2016

# OS X Lion - Technical Specifications

## General requirements

- Mac computer with an Intel Core 2 Duo, Core i3, Core i5, Core i7, or Xeon processor
- 2GB of memory
- OS X v10.6.6 or later (v10.6.8 recommended)
- 7GB of available space
- Some features require an Apple ID; terms apply.
- Some features require a compatible Internet service provider; fees may apply.

## Feature-specific requirements

### Time Machine

requires an additional hard drive or [Time Capsule](#) (sold separately).

### Photo Booth

requires a FaceTime or iSight camera (built in or external), USB video class (UVC) camera, or FireWire DV camcorder. Backdrop effects when using a DV camcorder require fixed focus, exposure, and white balance.

### FaceTime

Video calls require a built-in FaceTime camera, an iSight camera (built in or external), a USB video class (UVC) camera, or a FireWire DV camcorder; and a 128-Kbps upstream and downstream Internet connection. Making HD video calls requires a built-in FaceTime HD camera and a 1-Mbps upstream and downstream Internet connection. Receiving HD video calls requires a supported Intel-based Mac.

### Screen sharing

in iChat and the Finder requires a 128-Kbps Internet connection (300 Kbps recommended).

### iChat

Audio chats require a microphone and a 56-Kbps Internet connection. Video chats require a FaceTime or iSight camera (built in or external), USB video class (UVC) camera, or FireWire DV camcorder; and a 128-Kbps upstream and downstream Internet connection.

Backdrop effects when using a DV camcorder require fixed focus, exposure, and white balance. Some iChat features offer better performance and quality with higher system capabilities.

### AirDrop

supports the following Mac models:

- MacBook Pro (Late 2008 or newer)
- MacBook Air (Late 2010 or newer)
- MacBook (Late 2008 or newer)
- iMac (Early 2009 or newer)
- Mac mini (Mid 2010 or newer)
- Mac Pro (Early 2009 with AirPort Extreme card, or Mid 2010)

### Boot Camp

supports existing Boot Camp installations with Windows XP Service Pack 2, Windows Vista, or Windows 7. New Boot Camp installations require Windows 7 (sold separately).

### Exchange support

requires Microsoft Exchange Server 2007 Service Pack 1 Update Rollup 4 or Exchange Server 2010. Auto-setup requires enabling the Autodiscovery feature of Microsoft Exchange Server.

### QuickTime X movie capture

requires a FaceTime or iSight camera (built in or external), USB video class (UVC) camera, or FireWire DV camcorder.

### OpenCL

requires one of the following graphics cards or graphics processors:

- NVIDIA GeForce 320M, GeForce GT 330M, GeForce 9400M, GeForce 9600M GT, GeForce 8600M GT, GeForce GT 120, GeForce GT 130, GeForce GTX 285, GeForce 8800 GT, GeForce 8800 GS, Quadro FX 4800, Quadro FX5600
- ATI Radeon HD 4670, ATI Radeon HD 4850, Radeon HD 4870, ATI Radeon HD 5670, ATI Radeon HD 5750, ATI Radeon HD 5770, ATI Radeon HD 5870
- AMD Radeon HD 6630M, AMD Radeon HD 6750M, AMD Radeon HD 6770M, AMD Radeon HD 6970M



## **Gestures**

requires a Multi-Touch trackpad, Magic Trackpad, or Magic Mouse.

## **VoiceOver gestures**

require a Multi-Touch trackpad or Magic Trackpad.

## **Mac App Store**

is available only to persons age 13 or older in the U.S. and many other countries. Requires compatible hardware and software and Internet access; broadband recommended (fees may apply). Terms apply.

## **How to Get OS X Lion**

### **With every new Mac.**

Beginning when OS X Lion is released in July, every new Mac computer will come with OS X Lion.

### **Upgrading from OS X v10.6 Snow Leopard.**

Use Software Update to update to OS X v10.6.8, then purchase OS X Lion from the Mac App Store. The OS X Lion installer will download to the Dock and automatically launch. Follow the onscreen instructions to complete your installation.

### **OS X Lion Volume Licensing**

Digitally download, install, and deploy OS X Lion to every Mac in your business or educational institution. [Learn more.](#)

## **What's Included in OS X Lion**

### **Applications**

- Address Book
- Automator
- Calculator
- Chess
- Dashboard
- Dictionary
- DVD Player
- FaceTime
- Font Book
- iCal
- iChat
- Image Capture
- iTunes
- Launchpad
- Mail
- Mission Control
- Photo Booth
- Preview
- QuickTime Player
- Safari
- Stickies
- System Preferences
- TextEdit
- Time Machine

### **Utilities**

- Activity Monitor
- AirPort Utility
- Audio MIDI Setup
- Bluetooth File Exchange
- Boot Camp Assistant
- ColorSync Utility
- Console
- DigitalColor Meter
- Disk Utility
- Grab
- Grapher
- Keychain Access
- Migration Assistant

- Network Utility
- Podcast Capture
- Podcast Publisher
- RAID Utility
- AppleScript Editor
- System Information
- Terminal
- VoiceOver Utility
- X11

## Languages

- English
- Japanese
- French
- German
- Spanish
- Italian
- Dutch
- Swedish
- Danish
- Norwegian
- Finnish
- Traditional Chinese
- Simplified Chinese
- Korean
- Brazilian Portuguese
- Portuguese (Portugal)
- Russian
- Polish
- Czech
- Turkish
- Hungarian
- Arabic

[Learn more about all applications and utilities](#)

## Recovery partition

OS X Lion includes a built-in set of tools for repairing your Mac in the Recovery HD, a new feature that lets you repair disks or reinstall OS X Lion without a physical disc. Hold down Command-R during startup to boot into the Recovery HD, or hold down the Option key during startup and select Recovery HD. You can restore from a Time Machine backup, reinstall OS X Lion over the Internet from Apple's servers, or use Disk Utility to repair or erase a disk. [Learn more](#)

Published Date: Jul 18, 2018

# PowerBook G4 (1GHz/867MHz) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (1GHz/867MHz) - Technical Specifications

Available Configurations		
Order no.	M8858LL/A	M8859LL/A
Processor	867MHz PowerPC G4	1GHz PowerPC G4
Level 3 cache	1MB DDR SRAM	1MB DDR SRAM
Memory	256MB	512MB
Display	15.2-inch (diagonal) TFT	
Graphics	ATI Mobility Radeon 9000 with 32MB of DDR SDRAM	ATI Mobility Radeon 9000 with 64MB of DDR SDRAM
Hard disk drive <sup>(1)</sup>	40GB Ultra ATA	60GB Ultra ATA
Optical drive	Slot-loading Combo (DVD-ROM/CD-RW)	Slot-loading SuperDrive (DVD-R/CD-RW)
Ethernet	Built-in 10/100/1000BASE-T (RJ-45 connector)	
Modem <sup>(6)</sup>	Built-in 56K V.92 modem	
Wireless networking <sup>(5)</sup>	AirPort Ready	Built-in AirPort Card
System Software	Mac OS X, Mac OS 9	
Software	QuickTime, iCal, iChat, iMovie, iPhoto, iTunes, iDVD (requires SuperDrive), DVD Player, Mac OS X Mail, Microsoft Internet Explorer, EarthLink (includes 30 days of free service), Acrobat Reader, Art Directors Toolkit, FAXstf, Graphic Converter, OmniGraffle, OmniOutliner, PixelNance, Snapz Pro X, Developer Tools, Apple Hardware Test CD	
Hardware Accessories	Modem cable, power adapter, AC wall plug, power cord, S-video to composite adapter, DVI to VGA adapter. Product contains electronic documentation. Backup software provided on DVD.	
Limited Warranty and Service	Your PowerBook G4 comes with 90 days of telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> and get three years of service and support. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts.	

Build-to-Order Options	
In addition to choosing from Apple’s preconfigured systems, you can order a custom-configured PowerBook G4 from your authorized Apple reseller or the online Apple Store. Build-to-order options include processor speed, amount of RAM, hard disk capacity, and AirPort Card. Also available are additional lithium-ion batteries and power adapters, Apple flat-panel displays (2), external keyboards and mice, and third-party peripherals such as USB Zip and FireWire hard disk drives.	
Apple Studio Display (17-inch flat panel) M7649ZM/A	AirPort Card M7600LL/D
Apple Cinema Display (22-inch flat panel) M8058ZM/A	AirPort Base Station M8209LL/A
Apple Cinema HD Display (23-inch flat panel) M8537ZM/A	Apple Pro Mouse (White) M8690G/A
Apple Portable Power Adapter M8743LL/A	Apple Pro Keyboard (White) M8691G/A
Apple DVI to ADC Adapter M8661LL/A	iPod (5GB) M8513LL/A
Apple DVI to VGA Adapter M8754G/A	iPod (10GB) M8737LL/A
D-Link DWB-120M USB Bluetooth Adapter T4728G/A	iPod (20GB) M8738LL/A
PowerBook G4 Rechargeable Battery M8244G/B	AppleCare Protection Plan M8109LL/A
.Mac subscription M8778LL/A	

# 62\_PowerBook G4 (1GHz-867MHz) - Technical Specifications.pdf

## Technical Specifications

### Processor and memory

- 867MHz or 1GHz PowerPC G4 processor with Velocity Engine
- 1MB of DDR SRAM level 3 cache
- 133MHz system bus
- 256MB or 512MB of PC133 SDRAM; two SO-DIMM slots support up to 1GB

### Storage

- 40GB or 60GB 4200-rpm Ultra ATA/66 hard drive with up to ultra fast 298Mbps raw data rate.(1)
- One of the following slot-loading optical drives:
  - Combo drive (DVD-ROM/CD-RW); reads DVDs at 8x speed, writes CD-R and CD-RW discs at 8x speed, reads CDs at 24x speed
  - SuperDrive (DVD-R/CD-RW); writes DVD-R discs at 1x speed, reads DVDs at 6x speed, writes CD-R discs at 8x speed, writes CD-RW discs at 4x speed, reads CDs at 24x speed

### Communications

- Built-in 10/100/1000BASE-T Ethernet (RJ-45 connector)
- Built-in 56K V.92 modem (RJ-11 connector) (6)
- Built-in 11-Mbps AirPort Card (IEEE 802.11b DSSS compliant) in 1GHz configuration; 867MHz configuration is AirPort ready (5)

### Expansion

- One 400-Mbps FireWire (IEEE 1394) port (7)
- Two 12-Mbps USB ports
- One PC Card/CardBus slot supporting one Type I or Type II card

### Video and graphics support

- Built-in 2D/3D graphics acceleration through an integrated ATI Mobility Radeon 9000 graphics processor with AGP 4X support and 32MB or 64MB of DDR SDRAM video memory
  - Support for dual display and video mirroring: Millions of colors on the built-in display and on an external display at up to 2048 by 1536 pixels (8)
  - Support for a single external display: Millions of colors on an external display at up to 2048 by 1536 pixels (8)

- DVI output port
- VGA output with included Apple DVI to VGA Adapter
- S-video output port
- Composite output support with included S-video to composite adapter

### Display

- 15.2-inch (diagonal) built-in TFT display
  - Supports millions of colors at 1280-by-854-pixel resolution
  - Support for resolutions of 1280 by 854, 1152 by 768, 896 by 600, 720 by 480, and 640 by 480 pixels at 3:2 aspect ratio
  - Support for resolutions of 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio

### Audio

- Audio line in (minijack)
- Headphone out (minijack)
- Two built-in stereo speakers
- Internal omnidirectional microphone

### Security

- Kensington cable lock slot
- Keyboard lock

### Battery and power

- 61-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 5 hours of battery life (4)
- Power adapter with cable management system
- Power adapter port

### Keyboard and trackpad

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded keypad
- Solid-state trackpad provides precise cursor control; supports tap, double-tap, and drag capabilities

### Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

### Size and weight

- Height: 1.0 inch (2.6 cm)
- Width: 13.4 inches (34.1 cm)
- Depth: 9.5 inches (24.1 cm)
- Weight: 5.4 pounds (2.45 kg) with battery and optical drive installed(3)

- 1GB = 1 billion bytes; actual formatted capacity less.
- Connection to Apple flat-panel displays requires Apple DVI to ADC Adapter (sold separately).
- 867MHz model starts at 5.4 pounds with battery and optical drive installed. Actual weight varies by configuration and manufacturing process.
- Battery life depends on configuration and use.
- Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.
- Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.
- Actual rates will vary.
- Some third-party DVI displays may not support all resolutions.

Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. Product specifications are subject to change without notice.

# OS X Lion Server - Technical Specifications

## General requirements

- Mac computer with an Intel Core 2 Duo, Core i3, Core i5, Core i7, or Xeon processor
- 2GB of memory
- OS X v10.6.6 or later (v10.6.8 recommended)
- 10GB of available space
- Some features require an Apple ID; terms apply.
- Some features require a compatible Internet service provider; fees may apply.

## Feature-specific requirements

### Wiki Server

Interacting with Wiki Server requires a modern web browser such as:

- Safari 5 or later
- Firefox 4 or later
- Chrome 11 or later
- Mobile WebKit-enabled browsers
- Internet Explorer 9 or later

### Podcast Producer 2

512MB of RAM per core and a Quartz Extreme-enabled video chipset. For optimal performance, an Xsan clustered file service is recommended.

## How to get OS X Lion Server

### Upgrading from Snow Leopard, Snow Leopard Server or OS X Lion.

Upgrading your Mac to Lion Server couldn't be more hassle free.

### Maintenance Program

If you purchased the Apple Maintenance Program for OS X Server, you won't need to do anything. A copy of OS X Server v10.7 will be shipped to you automatically.

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## File and Print Services

- Mac (AFP, IPP)
- Windows (SMB/CIFS, IPP)
- UNIX and Linux (NFS, LPR/LPD)
- Internet (WebDAV)

## Communication Services

- iCal Server 3 (CalDAV, iCalendar, iTIP, iMIP)
- Wiki Server 3 (XML, RSS)
- iChat Server 3 (Jabber/XMPP)
- Address Book Server 2 (CardDAV, vCard)

## Mail Services

- SMTP (Postfix)
- POP and IMAP (Dovecot)
- SSL/TLS encryption (OpenSSL)
- Mailing lists (Mailman)
- Webmail (RoundCube)
- Junk mail filtering (SpamAssassin)
- Virus detection (ClamAV)

## Podcast Services

# 630\_OS X Lion Server - Technical Specifications.pdf

- Podcast Producer 2
- Podcast Capture
- Podcast Composer\*
- Podcast Publisher

## Web Hosting

- Apache web server
- SSL/TLS (OpenSSL)
- WebDAV
- Perl, PHP
- PostgreSQL

## Directory Services and Authentication

- Open Directory (OpenLDAP, Kerberos, SASL)
- LDAP directory connector
- Active Directory connector
- BSD configuration files (/etc)
- RADIUS

## Client Management

- Profile Manager
- Managed Preferences
- NetBoot
- NetInstall
- NetRestore
- Software Update Server
- Portable home directories

## Networking and VPN

- DNS server (BIND 9)
- DHCP server
- NAT server
- VPN server (L2TP/IPSec, PPTP)
- Firewall (IPFW2)
- NTP
- RADIUS

## Distributed Computing

- Xgrid

## High-Availability Features

- Automatic recovery
- File system journaling
- Software RAID
- Disk space monitor

## File Systems

- HFS+ (journaled, case sensitive)
- Xsan
- Read-only UFS

## Administration

- Server app
- Server Admin\*
- Server Status widget
- Workgroup Manager\*
- System Image Utility\*

# 630\_OS X Lion Server - Technical Specifications.pdf

- Xgrid Admin\*
- Secure Shell (SSH2)
- Server Monitor\*
- SNMPv3 (Net-SNMP)

## What's Included in OSX Lion Server

### Applications

- Server app
- Podcast Composer\*
- Server Admin\*
- Server Monitor\*
- System Image Utility\*
- Workgroup Manager\*
- Xgrid Admin\*

### Services

- Address Book Server
- AFP
- DHCP
- DNS
- Firewall
- iCal Server
- iChat Server
- Mail
- NAT
- NetBoot, NetInstall, NetRestore
- NFS
- Open Directory
- Podcast Producer
- Podcast Publisher
- Print
- RADIUS
- SMB
- Software Update
- VPN
- Web
- Wiki Server
- Xgrid

### Languages

- English
- Japanese
- French
- German
- Simplified Chinese
- Dutch
- Italian
- Korean
- Spanish
- Traditional Chinese

### Key Technologies

- Apache
- AppleScript
- ATOM
- Bonjour
- CalDAV
- Carbon
- CardDAV
- CDSA

# 630\_OS X Lion Server - Technical Specifications.pdf

- Cocoa
- Configuration Profiles
- Fibre Channel
- FireWire
- H.264
- HFS+
- IPv4 and IPv6
- IPFW
- Jabber/XMPP
- Kerberos
- L2TP/IPSec
- LDAP
- MDM
- OpenCL
- Perl
- PostgreSQL
- PPTP
- Python
- Quartz Extreme
- QuickTime X
- RAID
- 64-bit
- SCEP
- SNMP
- Spotlight
- Thunderbolt
- Unicode 5.1
- UNIX
- USB
- VNC
- WebDAV
- Xgrid

Published Date: Oct 14, 2016



# MacBook Air (11-inch, Mid 2011) - Technical Specifications

## Display

- High-resolution LED-backlit glossy widescreen display with support for millions of colors.
- 11.6-inch (diagonal) high-resolution LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions: 1366 by 768 (native), 1344 by 756, and 1280 by 720 pixels at 16:9 aspect ratio; 1152 by 720 and 1024 by 640 pixels at 16:10 aspect ratio; 1024 by 768 and 800 by 600 pixels at 4:3 aspect ratio

## Size and Weight

Ultrathin and ultralight unibody aluminum construction.

- *Height:* 0.11-0.68 inch (0.3-1.7 cm)
- *Width:* 11.8 inches (30 cm)
- *Depth:* 7.56 inches (19.2 cm)
- *Weight:* 2.38 pounds (1.08 kg)<sup>1</sup>

## Storage

All-flash storage.<sup>2</sup>

- 64GB flash storage
  - 128GB flash storage
- Configurable to 256GB flash storage, only at the Apple Online Store.

## Processor and Memory

Powered by a dual-core Intel Core i5 or i7 processor and DDR3 memory.

- Processor
  - 1.6GHz dual-core Intel Core i5 with 3MB shared L3 cache
  - Configurable to dual-core 1.8GHz Intel Core i7 with 4MB shared L3 cache, only at the Apple Online Store.
- Memory
  - 2GB or 4GB of 1333MHz DDR3 onboard memory

## Graphics

Advanced Intel HD Graphics 3000.

- Intel HD Graphics 3000 processor with 256MB or 384MB of DDR3 SDRAM shared with main memory<sup>3</sup>

## Video Support and Camera

Built-in FaceTime camera.

- FaceTime camera
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors

## Connections and Expansion

USB 2.0, Thunderbolt, headphone port, MagSafe power port, SD card slot (13-inch model).

□

- Two USB 2.0 ports (up to 480 Mbps)
- Thunderbolt port

## Battery and Power

Advanced lithium-polymer battery with MagSafe power adapter.<sup>4</sup>

- Up to 5 hours wireless web

# 631\_MacBook Air (11-inch, Mid 2011) - Technical Specifications.pdf

- Up to 30 days standby time
- Built-in 35-watt-hour lithium-polymer battery; 45W MagSafe Power Adapter with cable management system; MagSafe power port

## Wireless

Latest Wi-Fi and Bluetooth technologies.

- Wi-Fi  
802.11n Wi-Fi wireless networking;<sup>5</sup> IEEE 802.11a/b/g compatible
- Bluetooth  
Bluetooth 4.0 wireless technology

## Audio

Stereo speakers, microphone, and headphone.

- Stereo speakers
- Omnidirectional microphone
- Headphone port
- Support for Apple Earphones with Remote and Mic

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Limited Warranty and Service

Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

## DVD or CD Sharing

With the Mac App Store, getting the apps you want on your Mac has never been easier. No more boxes, no more discs, no more time-consuming installation. Click once to download and install any app on your Mac. But if an app you need isn't available from the Mac App Store, you can use DVD or CD Sharing. This convenient feature of OS X lets you wirelessly "borrow" the optical drive of a nearby Mac or PC. So you can install applications from a DVD or CD and have full access to an optical drive without having to carry one around.

## In the Box

- MacBook Air
- 45W MagSafe Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

## Included Software

### OS X Lion

Includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more. [Learn more about OS X Lion](#)

### Lion Recovery

OS X Lion includes a built-in set of tools for repairing your Mac in the Recovery HD, a new feature that lets you repair disks or reinstall OS X Lion without a physical disc. [Learn more about Lion Recovery](#)

### iLife

Includes iPhoto, iMovie, and GarageBand.

## Configurable Options

Purchase from the Apple Online Store to upgrade processor, memory, and flash storage.

- 1.8GHz dual-core Intel Core i7
- 4GB memory upgrade
- 256GB of flash storage
- Apple USB Ethernet Adapter
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter

Configure your MacBook Air with even more options, only at the [Apple Online Store](#)

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact.

**MacBook Air is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>6</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn about Apple's dedication to reducing the environmental impact of our products and process.](#) Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac or PC.](#)

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Idle	2.5	6.0
Hard drive accessing	N/A	N/A
CD drive accessing	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Express
- Final Cut Pro X

### Displays and Graphics

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter<

## AirPort and Wireless

- Apple USB Ethernet Adapter
- AirPort Extreme Base Station
- Time Capsule
- Apple Wireless Keyboard
- Apple Magic Mouse

## Other Accessories

- Apple MacBook Air SuperDrive
- Apple Keyboard
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. 1GB=1 billion bytes; actual formatted capacity less.
  3. Memory available to OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB or 384MB.
  4. Testing conducted by Apple in July 2011 using preproduction 1.7GHz dual-core Intel Core i5–based 13-inch MacBook Air units and preproduction 1.6GHz dual-core Intel Core i5–based 11-inch MacBook Air units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. The standby test measures battery life by allowing a system, connected to a wireless network, to enter deep sleep mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  6. PVC-free AC power cord is available in Australia, Japan, New Zealand, North and South America, Switzerland, Taiwan, Thailand, and the United Kingdom.
  7. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Sep 1, 2016

# Mac mini (Mid 2011) - Technical Specifications

	2.3GHz Mac mini	2.5GHz Mac mini
<b>Size and Weight</b>  The perfect fit for any desk.	<ul style="list-style-type: none"><li>• <i>Height:</i> 1.4 inches (3.6 cm)</li><li>• <i>Width:</i> 7.7 inches (19.7 cm)</li><li>• <i>Depth:</i> 7.7 inches (19.7 cm)</li><li>• <i>Weight:</i> 2.7 pounds (1.22kg)<sup>1</sup></li></ul>	<ul style="list-style-type: none"><li>• <i>Height:</i> 1.4 inches (3.6 cm)</li><li>• <i>Width:</i> 7.7 inches (19.7 cm)</li><li>• <i>Depth:</i> 7.7 inches (19.7 cm)</li><li>• <i>Weight:</i> 2.7 pounds (1.22kg)<sup>1</sup></li></ul>
<b>Processor and Memory</b>  Powered by a dual-core Intel Core i5 or i7 processor and DDR3 memory.	<b>Processor</b> 2.3GHz dual-core Intel Core i5 with 3MB on-chip shared L3 cache  <b>Memory</b> 2GB of 1333MHz DDR3 memory  Configurable to 4GB or 8GB, only at the Apple Online Store.	<b>Processor</b> 2.5GHz dual-core Intel Core i5 with 3MB on-chip shared L3 cache  Configurable to 2.7GHz dual-core Intel Core i7, only at the Apple Online Store.  <b>Memory</b> 4GB of 1333MHz DDR3 memory  Configurable to 8GB, only at the Apple Online Store.
<b>Storage</b>  A 500GB hard drive comes standard.	500GB (5400-rpm) hard drive <sup>2</sup> Both models configurable to 750GB (7200-rpm) hard drive; 2.5GHz model also configurable to 256GB solid-state drive or 256GB solid-state drive and 750GB (7200-rpm) hard drive, only at the Apple Online Store.	
<b>Graphics</b>  All-new graphics.	Intel HD Graphics 3000 processor with 288MB of DDR3 SDRAM shared with main memory <sup>3</sup>	AMD Radeon HD 6630M graphics processor with 256MB of GDDR5 memory
<b>Video Support</b>  Works with almost any display or HDTV.	<ul style="list-style-type: none"><li>• Thunderbolt port with support for up to 2560-by-1600 resolution</li><li>• HDMI port with support for up to 1920-by-1200 resolution</li><li>• DVI output using HDMI to DVI Adapter (included)</li><li>• Support for dual display and video mirroring</li></ul>	
<b>Audio</b>	<ul style="list-style-type: none"><li>• Audio line in minijack (digital/analog)</li><li>• Audio line out/headphone minijack (digital/analog)</li><li>• HDMI port supports multichannel audio output</li><li>• Support for Apple iPhone headset with microphone</li><li>• Built-in speaker</li></ul>	
<b>Connections and Expansion</b>  A new Thunderbolt port, an HDMI port, and plenty of peripheral ports.	<div>□</div> <ul style="list-style-type: none"><li>• Thunderbolt port (up to 10 Gbps)</li><li>• FireWire 800 port (up to 800 Mbps)</li><li>• Four USB 2.0 ports (up to 480 Mbps)</li><li>• HDMI port</li><li>• SDXC card slot</li><li>• Gigabit Ethernet port</li><li>• Audio in/out</li></ul>	

# 632\_Mac mini (Mid 2011) - Technical Specifications.pdf

Communications	<b>Wi-Fi</b> 802.11n Wi-Fi wireless networking; <sup>4</sup> IEEE 802.11a/b/g compatible	
	The latest Wi-Fi, Bluetooth, and Ethernet technologies.	<b>Bluetooth</b> Bluetooth 4.0 wireless technology
		<b>Ethernet</b> 10/100/1000BASE-T Ethernet (RJ-45 connector)
Electrical and Operating Requirements	<ul style="list-style-type: none"><li>• Line voltage: 100-240V AC</li><li>• Frequency: 50Hz to 60Hz, single phase</li><li>• Maximum continuous power: 85W</li><li>• Operating temperature: 50° to 95° F (10° to 35° C)</li><li>• Storage temperature: -40° to 116° F (-40° to 47° C)</li><li>• Relative humidity: 5% to 95% noncondensing</li><li>• Maximum altitude: 10,000 feet</li><li>• Typical acoustical performance<ul style="list-style-type: none"><li>◦ Sound pressure level (operator position): 16 dBA at idle<sup>5</sup></li></ul></li></ul>	
Limited Warranty and Service	Your Mac mini comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	
DVD or CD Sharing	With the Mac App Store, getting the apps you want on your Mac has never been easier. No more boxes, no more discs, no more time-consuming installation. Click once to download and install any app on your Mac. But if an app you need isn't available from the Mac App Store, you can use DVD or CD Sharing. This convenient feature of OS X lets you wirelessly "borrow" the optical drive of a nearby Mac or PC. So you can install applications from a DVD or CD and have full access to an optical drive without having to carry one around.	
In the Box	<ul style="list-style-type: none"><li>• Mac mini</li><li>• HDMI to DVI Adapter</li><li>• Power cord</li><li>• Printed and electronic documentation</li></ul>	
Included Software	<b>OS X Lion</b> Includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more. <a href="#">Learn more about OS X Lion</a>	
	<b>Lion Recovery</b> OS X Lion includes a built-in set of tools for repairing your Mac in the Recovery HD, a new feature that lets you repair disks or reinstall OS X Lion without a physical disc. <a href="#">Learn more about Lion Recovery</a>	
	<b>iLife</b> Includes iPhoto, iMovie, and GarageBand. <a href="#">Learn more about iLife</a>	
Configurable Options	<ul style="list-style-type: none"><li>• 2.7GHz dual-core Intel Core i7 processor</li><li>• 8GB DDR3 memory upgrade</li><li>• 750GB (7200-rpm) hard drive</li><li>• 256GB solid-state drive</li><li>• 256GB solid-state drive and 750GB (7200-rpm) hard drive</li><li>• Apple Remote</li></ul>	
Purchase from the Apple Online Store to upgrade your processor, memory, and hard drive.	<ul style="list-style-type: none"><li>• 4GB DDR3 memory upgrade</li><li>• 8GB DDR3 memory upgrade</li><li>• 750GB (7200-rpm) hard drive</li><li>• Apple Remote</li></ul>	

[Configure your Mac mini with even more options, only at the Apple Online Store.](#)

# 632\_Mac mini (Mid 2011) - Technical Specifications.pdf

## Mac mini and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**Mac mini is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>6</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn more about Apple's dedication to reducing the environmental impact of our products and process.](#) Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac or PC.](#)

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB			Sound Pressure Level, Operator Position $L_{pAm}$ (dB)		
	i5 2.3 GHz	i5 2.5 GHz	i7 2.0 GHz	i5 2.3 GHz	i5 2.5 GHz	i7 2.0 GHz
Idle	2.7	2.8	3.1	13	15	17
Hard drive accessing	2.8	2.9	3.1	16	16	18
CD drive accessing	N/A	N/A	N/A	N/A	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Express
- Final Cut Pro X

### Displays and Graphics

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort and Wireless

- AirPort Express Base Station
- AirPort Extreme Base Station
- Time Capsule
- Apple Magic Trackpad
- Apple Wireless Keyboard
- Apple Magic Mouse

### Other Accessories

- Apple MacBook Air SuperDrive
- Apple Keyboard

# 632\_Mac mini (Mid 2011) - Technical Specifications.pdf

- AppleCare Protection Plan
- 

1. Actual weight varies by configuration and manufacturing process.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Memory available to OS X may vary depending on graphics needs. Minimum graphics memory usage is 288MB.
4. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
5. Acoustics measured from typical operator position sitting in front of standard Mac mini system. Acoustics may vary by configuration.
6. PVC-free in all countries except China, Korea, and South Africa, where products ship with PVC-free internal cables only.
7. Mac mini achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Nov 1, 2012



# Mac mini Server (Mid 2011) Technical Specifications

2.0GHz Mac Mini Server

**Size and Weight**

- *Height:* 1.4 inches (3.6 cm)
- *Width:* 7.7 inches (19.7 cm)
- *Depth:* 7.7 inches (19.7 cm)
- *Weight:* 3.0 pounds (1.37 kg)<sup>1</sup>

The perfect size for a server.

**Processor and Memory**

**Processor**  
2.0GHz quad-core Intel Core i7 with 6MB on-chip shared L3 cache

Powered by a quad-core Intel Core i7 processor and DDR3 memory.

**Memory**  
4GB of 1333MHz DDR3 memory  
Configurable to 8GB, only at the Apple Online Store.

**Storage**

Dual 500GB hard drives come standard.

Dual 500GB (7200-rpm) hard drives<sup>2</sup>  
Configurable to dual 750GB (7200-rpm) hard drives, single or dual 256GB solid-state drives, or 256GB solid-state drive and 750GB (7200-rpm) hard drive, only at the Apple Online Store.

**Graphics**

Plenty of power for everyday tasks.

Intel HD Graphics 3000 processor with 384MB of DDR3 SDRAM shared with main memory<sup>3</sup>

**Video Support**

Works with almost any display or HDTV.

- Thunderbolt port with support for up to 2560-by-1600 resolution
- HDMI port with support for up to 1920-by-1200 resolution
- DVI output using HDMI to DVI Adapter (included)
- Support for dual display and video mirroring

**Audio**

- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- HDMI port supports multichannel audio output
- Support for Apple iPhone headset with microphone
- Built-in speaker

**Connections and Expansion**

A new Thunderbolt port, an HDMI port, and plenty of peripheral ports.

- Thunderbolt port (up to 10 Gbps)
- FireWire 800 port (up to 800 Mbps)
- Four USB 2.0 ports (up to 480 Mbps)
- HDMI port
- SDXC card slot
- Gigabit Ethernet port
- Audio in/out

**Communications**

**Wi-Fi**  
802.11n Wi-Fi wireless networking<sup>4</sup>; IEEE 802.11a/b/g compatible

The latest Wi-Fi, Bluetooth, and Ethernet technologies.

**Bluetooth**  
Bluetooth 4.0 wireless technology

**Ethernet**  
10/100/1000BASE-T Ethernet (RJ-45 connector)

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 85W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- Typical acoustical performance
  - Sound pressure level (operator position): 17 dBA at idle<sup>5</sup>

## Limited Warranty and Service

Your Mac mini with Lion Server comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

## In the Box

- Mac mini
- HDMI to DVI Adapter
- Power cord
- Printed and electronic documentation

## OS X Lion Server

Includes unlimited-client license, as well as Server app, Profile Manager, File Sharing for iPad, Push Notifications, Wiki Server, iCal Server, Mail Server, and Xsan. [Learn more about OS X Lion Server](#)

## Included Software

### OS X Lion

Includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more.

It's not just a server. It's a full-featured Mac.

### Lion Recovery

OS X Lion includes a built-in set of tools for repairing your Mac in the Recovery HD, a new feature that lets you repair disks or reinstall OS X Lion without a physical disc. [Learn more about Lion Recovery](#)

### iLife

Includes iPhoto, iMovie, and GarageBand. [Learn more about iLife](#)

## Configurable Options

Purchase from the Apple Online Store to upgrade your memory and hard drives.

- 8GB DDR3 memory upgrade
- Dual 750GB (7200-rpm) hard drives
- Single or dual 256GB solid-state drives
- 256GB solid-state drive and 750GB (7200-rpm) hard drive
- Apple Remote

[Configure your Mac mini with Lion Server with even more options, only at the Apple Online Store](#)

## Mac mini and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

# 633\_Mac mini Server (Mid 2011) Technical Specifications.pdf

**Mac mini is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>6</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>7</sup>

## **Apple and the Environment**

[Learn more about Apple's dedication to reducing the environmental impact of our products and process.](#) Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## **Recycling**

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac or PC.](#)

## **Accessories**

### **Mac Software**

- iWork
- Aperture
- Logic Express
- Final Cut Pro X

### **Displays and Graphics**

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### **AirPort and Wireless**

- AirPort Express Base Station
- AirPort Extreme Base Station
- Time Capsule
- Apple Magic Trackpad
- Apple Wireless Keyboard
- Apple Magic Mouse

### **Other Accessories**

- Apple MacBook Air SuperDrive
- Apple Keyboard
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Memory available to OS X may vary depending on graphics needs. Minimum graphics memory usage is 384MB.
  4. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  5. Acoustics measured from desktop server usage position of standard Mac mini with Lion Server system. Acoustics may vary by configuration.
  6. PVC-free in all countries except China, Korea, and South Africa, where products ship with PVC-free internal cables only.
  7. Mac mini achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Aug 12, 2011

# iMac (21.5-inch, Late 2011) - Technical Specifications

21.5-inch iMac

## Display

- High-resolution LED-backlit glossy widescreen display with support for millions of colors.
- 21.5-inch (viewable) LED-backlit glossy widescreen TFT display with support for millions of colors
  - Resolution: 1920 by 1080 pixels

Processor and Memory

Processor

3.1GHz dual-core Intel Core i3 with 3MB on-chip shared L3 cache

Powered by a dual-core Intel Core i3 processor and DDR3 memory.

Memory

2GB (one 2GB) of 1333MHz DDR3 memory

Configurable to 8GB, only at the Apple Online Store.

Storage

250GB hard drive.<sup>1</sup>

**250GB (7200 rpm) hard drive**

Graphics

Advanced AMD Radeon HD discrete graphics.

AMD Radeon HD 6750M graphics processor with 256MB of GDDR5 memory

Video Support and Camera

Built-in FaceTime HD camera.

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display
- Support for extended desktop and video mirroring modes

Audio

Built-in stereo speakers, built-in microphone, and headphone minijack.

- Built-in stereo speakers
- Two internal 20-watt high-efficiency amplifiers
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone
- Support for Apple iPhone headset with microphone

Connections and Expansion

SuperDrive, SDXC card slot, audio in, audio out, USB 2.0, FireWire 800, Mini DisplayPort, Gigabit Ethernet.

- Mini DisplayPort output with support for DVI, VGA, and dual-link DVI (adapters sold separately)
- One FireWire 800 port; 7 watts
- Four USB 2.0 ports
- SDXC card slot
- Slot-loading 8x SuperDrive with 4x double-layer burning (DVD±R DL/DVD±RW/CD-RW)
- Audio in/out
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

Input

**Apple Keyboard with Numeric Keypad**

The Apple Keyboard with Numeric Keypad features an elegant, ultrathin anodized aluminum enclosure; low-profile keys; and two USB 2.0 ports.

Apple Wired Keyboard and Mouse.

Apple Mouse

The Apple Mouse features the amazing Scroll Ball that lets you move anywhere inside a document, literally without lifting a finger. And with touch-sensitive technology concealed under the seamless top shell, you can choose either the versatility of a four-button mouse or the simplicity of a single-button beauty.

Wireless

**Wi-Fi**  
Latest Wi-Fi technology. 802.11n Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g compatible

Size and Weight

An all-in-one design for a small footprint.

- Height: 17.75 inches (45.1 cm)
- Width: 20.8 inches (52.8 cm)
- Depth: 7.42 inches (18.85 cm)
- Weight: 19.5 pounds (8.8 kg)<sup>3</sup>

Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 205W (21.5-inch models); 310W (27-inch models)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -4° to 116° F (-20° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- Typical acoustical performance
  - Sound pressure level (operator position): 18 dBA at idle<sup>4</sup>

Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer’s purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

iMac is designed with the following features to reduce its environmental impact:

Environmental Status Report

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Mercury-free LED-backlit display
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>6</sup>

Apple and the Global Environment

[Learn more](#) about Apple’s dedication to reducing the environmental impact of our products and process. [The Apple Product Environmental Specification](#) details the environmental attributes of our products.

Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

iMac 21.5 inch Dual-Core Intel Core i3 SPDC 3.1 GHz	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB	Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
		unit on table	unit on floor
Idle	3.0	16	-
Hard drive accessing	3.0	16	-
CD drive accessing	3.3	21	-

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

# 634\_iMac (21.5-inch, Late 2011) - Technical Specifications.pdf

## In the Box

- iMac
- Apple Keyboard with Numeric Keypad
- Apple Mouse
- Power cord
- Printed and electronic documentation

## Included Software

### OS X Lion

Includes Mail, Address Book, iCal, the Mac App Store, iTunes, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more.

### iLife

Includes iPhoto, iMovie, and GarageBand.

## Configurable Options

Purchase from the Apple Online Store to upgrade memory.

- 4GB memory upgrade (two 2GB)
- 8GB memory upgrade (two 4GB)

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Express

### Displays and Graphics

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort and Wireless

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station

### Other

- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. Weight varies by configuration and manufacturing process.
  4. Acoustics measured on standard 21.5- and 27-inch iMac systems. Acoustics may vary by configuration.
  5. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  6. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Sep 23, 2011

# Final Cut Pro 7 - Technical Specifications

## Minimum System Requirements

- Mac computer with an Intel processor
- 1GB of RAM (2GB of RAM recommended when working with compressed HD and uncompressed SD sources; 4GB of RAM recommended when working with uncompressed HD sources)
- ATI or NVIDIA graphics processor. Integrated Intel graphics processors are not supported except the Intel HD Graphics 3000.
- 128MB of VRAM
- Display with 1280-by-800 resolution or higher
- Mac OS X v10.5.6 or later
- QuickTime 7.6 or later
- DVD drive for installation
- For burning Blu-ray discs: a Blu-ray recorder

## Editing and Timeline

- Mix frame sizes, frame rates, and formats in the same Timeline in real time
- Edit at 23.976, true 24, 25, 29.97, 30, 50, or 60 fps
- Automatic Sequence Conform creates correct sequence settings with first edit
- Multicam editing of up to 128 sources with real-time playback of up to 16 angles
- Source/Record three-point editing model
- Insert and overwrite with or without transitions
- Replace, fit to fill, and superimpose edits
- Edit overlay for drag-and-drop editing
- Blade and Blade All tools for adding edits
- Extend and split edits
- A/V Sync indicators in Timeline
- Adjacent (through edit) indicators in Timeline
- Dupe detection in Timeline
- Keyframe graphs
- Track targeting
- Track locking
- Auto Select tools
- Multi colored markers for sequences and clips
- Ripple sequence markers
- Matchframe for master clips, subclips, and subclip parent clips
- Multi-Touch gesture support
- Color-coded, drag-and-drop reorder of tabs in the Timeline
- Close Other Tabs shortcut in Timeline and Browser

## Trimming

- Ripple
- Roll
- Slip and slide
- Lift and ripple delete
- Asymmetric, multitrack trimming
- Dynamic trimming
- JKL trimming
- Trim window
- Timeline trimming
- Keyboard and numeric moving and trimming
- Close Gap

## Effects

- FxPlug support
- Alpha Channel Matte Transitions
- Global Transitions adds effects between In and Out points
- Direct access and modify Motion templates
- RT Extreme for scalable software-based, multistream real-time effects in SD and HD formats
- Dynamic RT for automatically adjusting playback quality and/or frame rate based on hardware capabilities
- Motion integration for advanced motion graphics work
- 8-bit, 10-bit, and HDR (32-bit floating point) image processing
- Speed Tool for speed changes in the Timeline
- Change Speed interface with speed ramping presets
- Keyframe graphs and editing in Viewer or Timeline
- More than 200 transitions, effects, and filters
- Unlimited effects favorites
- Copy and paste motion and effect attributes to multiple clips
- Unlimited layers with support for nesting
- Bezier curves with movable motion paths
- Numeric control and keyframe capabilities for precise animation and effects
- Advanced 2D and 3D titles with Boris Calligraphy included
- Composite and transfer modes
- Import multilayered Photoshop files with layers and Alpha channel support
- FXScript and FXBuilder for designing custom filters and effects
- Safe Area Display for positioning titles and effects for SD inside HD frame

## Tools

- Large Timecode Viewer with additional display for metadata
- iChat Theater preview for real-time collaboration
- High-quality, real-time video vectorscopes and waveform monitors
- Multitrack Audio Mixer
- Keyboard and user interface customization tool
- Voice Over tool for adding narration directly to Timeline
- Frame Viewer for split screen shot comparisons
- Source timecode and film footage overlays in Viewer and Canvas
- QuickView for RAM-based previews of complex multilayered sequences

## Audio

- Subframe audio keyframing to 1/100th of a frame
- Real-time audio filter adjustments during playback
- Up to 24 channels in and out
- 5.1 surround sound monitoring
- OMF audio export with pan and volume levels
- Real-time, software-based audio normalization
- Onscreen multitrack mixing console
- External control surface support
- Soundtrack Pro round-trip for advanced audio mixing and sound design
- Real-time fader automation
- Variable keyframe thinning
- Real-time audio filters and effects
- Sampling up to 96kHz and 24 bits
- Audio level meters per track
- Mac OS X Audio Units plug-in support
- Pan controls
- Mute and solo controls
- Audio waveform display in Viewer and Timeline
- Logarithmic audio fades
- More than 30 audio filters

## Color Correction

- Send to Color
- Primary (three-way) color corrector
- Secondary (two-way) color corrector
- Image control filters
- 4- and 8-point garbage mattes
- Real-time, hardware-accurate waveform monitor and vectorscopes
- Broadcast-safe filter
- Range-checking zebra stripe overlays

## Application

- Digital Cinema Desktop for full-screen, real-time SD, HD, and 2K preview playback on main screen or an attached Apple Cinema or LED Cinema Display
- SD, HD, and 2K monitor full-screen playback with Apple-certified third-party PCI card or device
- Mode-free interface for workflow efficiency
- Multiple sequences and projects open simultaneously
- Up to 99 levels of undo
- 99 audio and 99 video tracks with support for nesting sequences together
- User preferences that can be moved from system to system
- Easy Setups for quick configuration
- Dynamic and customizable window resizing and arrangements
- Customizable keyboard and user interface buttons
- Customizable real-time effects settings
- Customizable render settings
- Customizable Browser layouts
- Customizable track layouts
- External editor support (helper applications)
- Create Support Profile command for improved AppleCare support
- Full Unicode support



## Film

- Cinema Tools 4.5 included
  - Comprehensive, integrated film management tools
  - Create PDF, text, and XML film lists for asset tracking
  - Drag and drop files to create new or add into existing Cinema Tools databases
  - Import RED media and DPX image sequences directly into Cinema Tools
  - Create change lists from 2 XML exports from Final Cut Pro
  - Use Cinema Tools databases for relinking of EDLs with 2K and 4K media in Color
  - Include timecode and keycode in the same list
  - Support for 35mm 3-perf, 35mm 4-perf, and 16mm-20 and mixed film formats
  - View feet and frames in Timeline
  - View keycode and ink number overlays on video in Final Cut Pro
  - Film data information in Final Cut Pro Browser
  - 24-fps EDL import and export
  - 24-fps EDL conversion to and from 29.97 fps
  - Import ALE, ATN, FLX, and FTL files in both Cinema Tools and Final Cut Pro
  - Track key numbers, ink numbers, video and audio timecode
- Output the following lists:
    - Cut list
    - Change list
    - Optical list
    - Pull list
    - Dupe list
    - Missing elements list
    - Audio EDL
  - Synchronize Cinema Tools database with Final Cut Pro
  - Poster frame capability
  - Conform clips to specified frame rate
  - Reverse telecine function in either Cinema Tools or Final Cut Pro
  - Export ALE files
  - Import and export Final Cut Pro batch capture lists

## Supported Formats and I/O\*

- Apple ProRes family, a 10-bit, full-width VBR codec that supports all major frame sizes and frame rates at target bit rates from 10 Mbps to 754 Mbps
- DVCPRO HD (P2), XDCAM EX, AVC-Intra, AVCHD, RED (with additional software from RED) import through Log and Transfer with automatic logging, custom naming, browse, mark, and background ingest
- Easy Export supports presets for background export to Apple TV, iPhone, iPod, YouTube, DVD, Blu-ray disc
- Apple-designed menus for DVD and animated menus for Blu-ray discs
- Broadcast Wave Format with drop and non-drop frame timecode options
- Native editing for DV, DVCAM, DVCPRO, DVCPRO 50, and DVCPRO HD
- Native editing for HDV including 1080i 50/60, 1080p 24/25/30, 720p 24/25/30/50/60
- Native AVC-Intra playback for both AVC-Intra 100 and AVC-Intra 50 at 1080p 24/25/30, 1080i 50/60, 720p 24/25/30/50/60
- Sony XDCAM HD at 25-Mbps CBR, 18- and 35-Mbps VBR at 1080i 50/60 and 1080p 24/25/30/VFR with free Sony software
- Sony XDCAM HD422 1080i 50/60, 1080p 24/25/30, 720p 24/25/30/50/60 with free Sony software
- Sony NXCAM SD (PAL and NTSC) is supported using Apple ProRes 422
- Sony XDCAM EX 1080p 24/25/30, 1080i 50/60, 720p 24/25/30/50/60 with free Sony plug-in
- JVC created, Apple QuickTime-wrapped XDCAM EX media imported with drag and drop to a Final Cut Pro bin
- AVCHD and AVCCAM editing is supported using Apple ProRes
- Sony IMX playback support at 30, 40, and 50 Mbps for SD
- Sony IMX ingest and output supported with free Sony software
- Panasonic P2 playback support at 1080p 24/25/30, 1080i 50/60, and 720p 24/24N/25/25N/30/50/60/VFR from P2 cards
- 1080pA 24 (Advanced Pulldown) supported via FireWire from Panasonic AJ-HD1200A and AJ-HD1400
- Uncompressed 8- and 10-bit HD (4:2:2 YUV) via Apple-certified third-party PCI card/device
- Uncompressed 8- and 10-bit SD (4:2:2 YUV) via FireWire or Apple-certified third-party PCI card/device
- Apple Intermediate Codec
- OfflineRT Photo-JPEG codec
- Telecine 29.97i to 24p pulldown removal
- 25 fps @24 fps conversion for editing film in PAL
- Frame-accurate log and captures
- Frame-accurate insert and assemble edit-to-tape
- Serial device control (RS-422, RS-232)
- FireWire device control
- Log and capture tool with support for batch, clip, and on-the-fly capturing
- Still images: PSD, BMP, JPEG, PICT, PNG, SGI, Targa, TIFF
- Automatic Transfer ingests file-based media with custom clip naming
- Closed captioning preserved for capture and output to tape

## Media Management

- Export OMF with volume and pan levels
- Media management tools for moving, copying, and consolidating media at sequence or project level
- Render file manager
- Extensive search, sort, and sift capabilities in Browser
- Rename Clips to match media and vice versa
- Maintain Master clips across multiple projects
- Master and affiliate clips
- Reveal Clip or Project in Finder
- Clip label colors
- Custom comment fields
- Integrated film database with Cinema Tools 4.5
- Automatic reconnect to high-resolution media
- EDL import for batch capture or export for basic metadata exchange
- Autosave Vault
- XML interchange format for custom integration work
- Background rendering, compressing, and transcoding to multiple formats with Easy Export
- Batch export
- Send to Compressor integration

\*Some features require additional hardware and software. Capturing HD resolution video using the Apple ProRes format requires a Mac Pro with an Intel processor and an Apple-qualified third-party capture card or device. DV, DVCPRO 50, and DVCPRO HD output requires a FireWire-enabled camera or deck. SD output via FireWire requires an AJA Io. Please contact your Apple Authorized Reseller for more information.

Published Date: Jul 26, 2017

# Motion 4 - Technical Specifications

## Minimum System Requirements

- Mac computer with an Intel processor
- 1GB of RAM (2GB of RAM recommended when working with compressed HD and uncompressed SD sources; 4GB of RAM recommended when working with uncompressed HD sources)
- ATI or NVIDIA graphics processor. Integrated Intel graphics processors are not supported except the Intel HD Graphics 3000.
- 128MB of VRAM
- Display with 1280-by-800 resolution or higher
- Mac OS X v10.5.6 or later
- QuickTime 7.6 or later
- DVD drive for installation

## User Interface

- Unlimited tracks of movie clips, graphics, text, and particles
- Project sizes up to 4K (4K resolution requires a graphics card with 256MB of VRAM or more)
- Color bits-per-channel: 8-bit, 16-bit float, and 32-bit float (float processing requires a graphics card with 128MB of VRAM; 256MB or more recommended)
- Customizable nonsquare-pixel support
- Semitransparent heads-up display with onscreen controls for layers, behaviors, and filters
- Onscreen controls for 3D position, 3D rotation, 3D anchor point, skew, four corner pin, crop, and text glyph manipulations
- Enable/Disable float bit-depth viewing independent of project setting
- Enable/Disable viewing and rendering of Lighting, Shadows, Reflections, and Depth of Field
- View color channels and alpha channels independently
- Canvas alignment tools including dynamic alignment guides, 3D grid, and rulers
- Pen-and-tablet gesture-based interface
- 3D mouse support
- Integrated File Browser for fast access to Finder content
- RAM Previews for viewing complex animations at full frame rate
- Save favorite settings, customized effects, gradients, text styles, and more in the Library
- Over 1400 pieces of Apple-designed, royalty-free vector artwork, high-resolution images, and animated design elements
- Instantly display and access all layers in the project using a single keystroke, similar to Exposé in Mac OS X
- Customizable toolbar that places your favorite tools at your fingertips
- Create, save, and remap custom keyboard shortcuts
- Show images outside the visible frame boundary for easily adjusting off-screen objects
- Automatically collect media used in a project for easy backup or moving to other locations
- Use Spotlight in Mac OS X to locate Motion projects by searching on any layer name or text string created in the project

## 3D Compositing Environment

- Position, rotate, and intersect multiple layers in 3D space
- Combine multiple layers into 3D groups for hierarchical 3D animations
- Add, animate, and cut between multiple cameras
- Unique Walk-Camera intuitively operates like a first-person video game
- Adjust the camera's near and far soft clipping planes to avoid object "popping"
- Apply Camera behaviors for easily creating and modifying complex camera moves
- Quad split view for displaying multiple orthographic and perspective views
- Inset viewer for quickly checking alternative views while making adjustments
- Multiple light sources including ambient, directional, point, and spot
- Enable shadows for selected point or spot lights, define objects to receive or cast shadows, and control the shadow colors and softness
- Enable Reflectivity on most objects, movies, paint strokes, and more
- Activate depth of field to enhance realism and control focus
- Enable particles, Replicator elements, and paint strokes to animate in 3D space
- Create 3D text behaviors for character-by-character animations with full 3D position and rotation control
- Create 3D motion paths for layers, cameras, and light sources
- Apply behaviors like throw, orbit, and vortex with 3D attributes
- Isolate any layer to a Front view for easily modifying masks or editing text

## Timeline Editing and Layering

- Layer list view makes it easy to change the stacking order of any layer, group, filter, or animation behavior
- Grouping for applying compound transformations and filters
- Common “bring to front” and “send to back” functions
- Opacity and blend mode display for quick access on every layer and group
- Create drop zones for easy drag-and-drop image replacement
- Clone layers for linking instances of images that inherit properties automatically
- Solo tracks for easier viewing and refinements
- Isolate selection for temporary framing and solo of an object to facilitate editing of an object in a 3D composition
- Composite with premultiplied or non-premultiplied Alpha channels
- Mini-Timeline built into the Canvas that displays a single track for the currently selected layer, group, filter, or behavior
- Trim, slip, slide, and retime audio and video clips via the mini-Timeline
- Retime clips using frame blending, motion blur blending, or optical flow
- Cache optical flow retiming analysis to change speed at any time without reanalyzing
- Full Timeline with drag-and-drop editing to choose between compositing and assembling multiple clips
- Insert and overwrite editing directly into the Timeline
- Display and edit audio tracks in the Timeline or in the Audio Editor
- Markers that can be placed in the Timeline or on a specific clip with notes

## Animation

- Unique behavior animations for creating natural phenomena like wind, gravity, and vortex
- Sophisticated simulations like attract, repel, and orbit, which create multilayered 3D animations
- Text sequencing for automating complex title animations in 3D space
- Auto-animated Parameter control like oscillate, wiggle, and more
- Parameter linking for driving secondary animations
- Retiming behaviors automate ramping in and out of speed changes
- Audio behavior for syncing animations with audio tracks
- MIDI behavior for triggering parameter changes via any MIDI device
- Shape behaviors allow for tracking points on a shape or creating random wiggling animated shapes
- Complete keyframe-based animation tools
- Keyframe Editor with Bezier, Linear, Constant, and Ease In/Ease Out curve interpolations
- Keyframe Editor with a keyframe edit tool, keyframe sketch tool, and a keyframe box manipulation tool
- Copy and paste keyframes from different tracks and parameters
- Keyframe settings for ping pong, repeat, and progressive
- Record Animation feature with keyframe thinning for recording animations in real time
- Draw keyframes in the Keyframe Editor using freehand pen tool
- Squish, stretch, and move groups of keyframes using a transform box
- Save curve sets for quick access to common parameters
- View animated curves for easier navigation
- View keyframes in the Timeline for quick positioning
- Enable/Disable keyframe and behavior-based animations to easily compare different results

## Particle Engine

- Sprite-based particle engine with accelerated performance
- Over 200 particle presets for easy access to sparkles, fire, smoke, and more
- Animate particles in 3D space with “Face-Camera” control
- Apply multiple objects or video clips as emitters
- Apply additive blend mode for intense glowing results
- Animate emitters and cells independently
- Save newly created particles in the Library for reuse in other projects
- Choose between point, line, rectangle, circle, box, sphere, and more for emitter shapes
- Control birth rate, life, speed, angle, spin, scale, and gradient colors for particle cells
- Scale particles over their life or add behaviors like orbit and vortex for amazing 3D results with little effort

## Paint Effects

- Paint with pressure-sensitive vector-based brush strokes
- Select from over 100 customizable brush styles from traditional to abstract
- Modify brush width, color, opacity, and jitter over the stroke path
- Automatically draw on and draw off with full customization
- Edit brush strokes as Bezier or advanced B-spline paths
- Rotate the stroke in 3D space with “Face-Camera” control for volumetric 3D strokes
- Assign pressure and speed to brush properties when using a pen and tablet
- Enable dynamics on paint dabs for particle paint type effects
- Apply Replicator-like sequencing animations that can cause the paint stroke to ripple through 3D space

## Replicator Tool

- Automatic replication of any graphic, text object, or movie file along defined patterns
- Over 200 Replicator presets that can be completely customized and resaved
- Animate replicated patterns in 3D space with “Face-Camera” control
- Save newly created Replicators in the Library for reuse in other projects
- Choose between line, rectangle, circle, burst, spiral, wave, box, sphere, and more for Replicator patterns
- Define the number of rows, columns, and 3D ranks that fill or outline the pattern
- Control pattern size, cell size, angle, scale, and gradient colors for Replicator cells
- Change the offset for rows and columns, causing them to shift position across the defined pattern
- Control origin of animation from various points of the pattern
- Add random scale and angle setting for more natural replications
- Apply additive blend mode for intense glowing results
- Set color of replicated objects from a single tint to a user-defined range
- Add Replicator Sequence behavior for wavelike animations over various patterns

## Title Design

- Vector-based text engine for creating clean type at any size
- Import capability supporting Text and RTF files to create Motion text objects
- Format text using size, rotation, slant, tracking, kerning, and more
- Animate individual text characters in 3D space using customizable text behaviors
- Transform single characters with the Adjust Glyph tool
- Select from common set of blend modes, including normal, multiply, screen, and add
- Customize text styles with control over the face, outline, glow, and drop shadow
- Type-on and text on a path layout/animation options
- Scroll and Crawl layouts/animation options that support large amounts of text
- Text field parameter in Inspector makes it easy to edit text even if text is obscured in the Canvas
- Fill text with solid or multipoint gradients
- Apply static images or video clips as textures to text faces
- Control textures using hold frame, offset, wrap modes, and opacity
- Support for Asian, Cyrillic, and other Unicode system fonts
- Support for Apple LiveFonts for unique font styles and animations

## Tracking and Stabilization

- Match move using single-point tracking or four corner pinning
- Create tracking data that can be referenced by multiple objects
- Track a filter's onscreen position controls
- Offset tracking for creating a single track from multiple offsets
- Tracking behavior highlights best potential tracking points, eliminating guesswork
- Advanced tracking algorithm maintains accurate analysis when patterns rotate or skew
- Smart retry resets search region automatically for less user intervention
- Provide directional hints for fast-moving regions by using Look-ahead feature
- Stabilize using traditional point stabilizer or optical flow analysis
- Automated optical flow stabilizer bypasses selecting points and time-consuming setup
- SmoothCam optical flow analysis removes jitter and rocking from handheld shots while retaining overall camera moves
- Adjust amount of smoothing applied to transforms, rotation, and scaling in real time

## Accelerated Filters and Effects

- Over 120 accelerated filters for real-time interactivity
- More than 10 blur filters, including Gaussian, Channel Blur, Radial Blur, and Defocus
- Simple and bevel borders
- More than 20 color correction filters, including Color Balance, Gradient Colorize, Color Reduce, and Threshold
- More than 25 distortion filters, including Basic 3D, Refraction, Insect Eye, Glass Distortion, Ripple, Scrape, and Polar
- Stunning glow effects for Light Rays, Bloom, Aura, and more
- PrimatteRT chroma keyer
- Stylize filters like Vignette, Bad TV, Bad Film, Color Emboss, Half Tone, Line Art, and Slit Tunnel
- Unique kaleidoscope and tiling filters
- Time-based filters for echo and strobe effects
- Video filters for deinterlacing and broadcast-safe colors and luminance
- Generators that automatically generate patterns, noise, colors, caustics, and concentric shapes and spirals
- Text generators that create and animate text elements like numbers, currency, dates, and timecode or can generate text using the contents of a text file
- Support for wide array of GPU-accelerated third-party FxPlug filters

## Masking Tools

- Bezier or advanced B-spline masking tools
- Create ovals, rectangles, and arbitrary freehand shapes
- Control opacity, rounding, and edge feathering
- Combine masks using mathematical operations
- Track entire shapes or control points using tracking behaviors
- Create image masks from alpha, luminance, or RGB values of a second image

## Audio

- Support for AIFF, WAV, MP3, VBR MP3, and AAC (MPEG-4 Audio)
- Edit audio tracks in the Timeline with trim, slip, and move
- Retime audio tracks with pitch change
- Scrub audio tracks for frame-accurate positioning
- Control balance, gain, mute, and solo individually
- Use master audio controls for global audio adjustments
- Keyframe audio volume in Audio Editor
- Trigger parameter changes based on audio frequencies or transient hits

## Final Cut Pro Integration and Third-Party Support

- Open Timeline data from Final Cut Pro, including cuts, layers, transforms, and retiming data
- Open Motion directly from the Final Cut Pro Timeline, bypassing import/export steps
- Create master templates in Motion that retain editable text and drop zones in Final Cut Pro
- Animations from Motion automatically update in the Final Cut Pro Timeline when changes are made in Motion
- Round-trip editing between DVD Studio Pro and Motion, making it simple to create and modify Motion menus without intermediate rendering
- Send audio from Motion to Soundtrack Pro Waveform Editor; sound design changes in Soundtrack Pro automatically update in Motion
- Preview projects on a broadcast monitor using AJA I/O, Matrox, or Blackmagic devices
- Import vector PDF graphics or Photoshop layered documents
- Import OpenEXR files (float processing requires a graphics card with 128MB of VRAM; 256MB or more recommended)
- Support for third-party FxPlug plug-ins
- Support for Image Unit plug-ins

# 636\_Motion 4 - Technical Specifications.pdf

## Export

- Share feature can export and deliver content automatically to devices like iPod and Apple TV or services like YouTube in a few clicks
- Export to ProRes, H.264, MPEG-4, and other QuickTime-supported codecs
- Export as movies or image sequences
- Export as 16-bit or 32-bit floating-point OpenEXR format (float processing requires a graphics card with 128MB of VRAM; 256MB or more recommended)
- Support for progressive and field-based rendering
- Accelerated motion blur with customizable shutter
- Save custom export settings for easier selection
- Export Selection can render out selected objects and even automatically re-import the render back to the Motion Timeline

Published Date: Jul 26, 2017



# Soundtrack Pro 3 - Technical Specifications

## Minimum System Requirements

- Mac computer with an Intel processor
- 1GB of RAM (2GB of RAM recommended when working with compressed HD and uncompressed SD sources; 4GB of RAM recommended when working with uncompressed HD sources)
- ATI or NVIDIA graphics processor. Integrated Intel graphics processors are not supported except the Intel HD Graphics 3000.
- 128MB of VRAM
- Display with 1280-by-800 resolution or higher
- Mac OS X v10.5.6 or later
- QuickTime 7.6 or later
- DVD drive for installation
- For 5.1 surround monitoring of multichannel audio content: an audio interface with a minimum of six outputs
- For multitrack recording: an audio interface with multiple inputs

## Precise Audio Control

- Nondestructive, sample-accurate editing of audio files
- Support for up to 24-channel files, including mono, stereo, and surround
- Action-based editing to modify, reorder, suspend, or delete any audio edit, plug-in, or process
- Audio Effects and Audio Units plug-ins can be applied to supported audio files as Actions
- Audio Effects and Audio Units plug-ins can be applied to supported audio files as real-time effect chains
- Real-time effects applied to audio files can be rendered to Actions
- Normalize function with Peak, RMS analysis and processing
- Integrated multichannel file editor
- Intelligent analysis, repair, and restoration functions for:
  - Clicks and pops
  - Power line hum
  - DC offset
  - Phase
  - Clipped signal
- Audio time stretching without affecting pitch
- Included time-stretch algorithms:
  - Apple Time Stretch Universal
  - Apple Time Stretch Complex
  - Apple Time Stretch Percussive
- Integrated support for third-party time-stretch algorithms (sold separately):
  - Serato Pitch 'n Time LE
  - SoundToys Speed
  - iZotope Radius
- Ambient Noise Print to quickly replace unwanted noises from location recordings
- Background Noise Removal including noise print
- Sample ruler units in sample value, normalized, percent, and decibel view
- Snapping to ruler ticks, seconds, frames, markers, and edit points
- Selectable nudge values: 1 subframe, 1/4 frame, 1 frame, 10 frames, 1 second
- Support for bit depths up to 32-bit float
- Support for sample rates from 2kHz to 192kHz
- Support for AIFF, WAV, MP3, AAC, CAF, BWF, SDII, NeXT, QuickTime, and STAP (Soundtrack Audio Project) file playback
- Saves files nondestructively as STAP files or destructively as AIFF, WAV, SDII, QuickTime, CAF, or NeXT
- Export mixes as AIFF, WAV, NeXT, SDII, MP3, AAC/Podcast, or Dolby Digital Professional (AC-3), or use Compressor for additional file support
- Selection history
- Waveform and customizable Frequency Spectrum views with linear and logarithmic display
- Frequency selection and editing in Frequency Spectrum view
- Animated waveform feedback
- Mini-waveform view

## Advanced Sound Design

- Processes including:
  - Fade in/Fade out
  - Normalize
  - Amplitude adjust
  - Silence
  - Invert
  - Add, delete, reorder channels
  - Mono conversion
  - Resample
  - Generate silence, white noise, pink noise, sine wave, sawtooth wave, square wave, or triangle wave
- Support for Audio Units plug-ins
- Audio Units presets available to all Audio Units-compatible applications
- More than 6000 sound effects, music beds, and music loops, including over 1000 in surround
- Powerful media search engine
- Support for Apple Loops, AIFF, WAV, MP3, AAC, CAF, and ACID sound and music libraries

## Advanced Take Management

- Multitake management with take recording and editing directly in Multitake Editor
- Multitake Editor allows comps of multitake recordings and other audio files
- Combine individual phrases from different takes
- Automatic customizable crossfade between phrases
- Single-click take selection
- Adjustable transition boundaries for multitake comps
- Final comp functions as stand-alone clip while retaining access to all takes
- Slide phrases within edit boundaries

## Professional Multitrack Audio Editing

- Single window with customizable tab panes
- Customizable window layouts
- Dynamic tab panes with quick show/hide functionality
- Resizable video window tab
- Multitrack Timeline with tracks, busses, submixes, and master in mono, stereo, or surround
- Multiple multitrack and audio file projects open at once
- Mixed sample rates, bit depth, and file formats supported in multitrack projects
- Time- or beat-based tracks
- Ruler in HH:MM:SS, seconds, samples, frames, drop frame, non-drop frame, beats
- Waveform Zoom in the Timeline
- Find and replace related files in the Timeline
- Adjustable playhead auto-scrolling: on, off, centered
- Loop clip transposition
- Loop clip speed adjustments (quadruple, double, normal, half, quarter)
- Adjustable automatic and manual crossfades
- Fade selector for customizing fade in, fade out, and crossfades
- Tape style and sample repeat scrubbing
- Rolling edit tool
- Native and custom timecode spotting
- Multitrack recording of mono, stereo, and multichannel files
- Lift and Stamp tools to selectively copy voice level, process effects, and equalization print from one clip to another
- Lifted Data sets can be saved as presets
- Equalization Matching aligns the EQ characteristics of two selections
- Automation parameters can move with clips or lock to absolute time
- Pull up/pull down of audio and video to all common standards
- Customizable clip and track colors
- Clip locking in multitrack
- Clip disabling in multitrack
- Momentary mono switch
- Automatable master tempo, master volume, master effects, and key
- Automation of most mix and effect parameters with read, touch, and latch modes
- Pre- and post-fader send busses for application of common effect plug-ins to multiple tracks
- Output bussing for single fader control of multiple tracks
- Support for multichannel audio output devices
- Time, duration, podcast, beat, and end-of-project markers
- Powerful browser for locating content quickly
- Multipoint Video HUD
- Tool HUD
- Timecode HUD
- Numeric Clip offset
- Bin with access to multiple projects, media files, markers, and clips
- Spotlight-style searching in Bin
- Support for Multi-Touch trackpad gestures

## Surround and Stereo Mixing

- Discrete 5.1 mixing, bussing, and routing
- Console-style Mixer with full stereo and surround meters on every track, buss, submix, and master
- Mono, stereo, and surround files can be combined on same track
- Support for multichannel surround files
- Surround Panner enables panning of mono, stereo, and surround audio files
- Surround Panner HUD with automatable controls for rotation, width, collapse, center bias, LFE balance, and individual speaker disabling
- Surround and stereo panner automation data simultaneously available on each track
- Automatic surround to stereo Dolby-standard downmix
- Support for true surround and multi-mono effects
- Over 1000 royalty-free surround sound effects and music tracks
- Control surface support for the following protocols:
  - EuCon
  - Mackie Control
  - Logic Control

## Integrated Workflow

- AppleScript scriptable (executable from Soundtrack Pro, Final Cut Pro 7, or as AppleScript droplets for batch processing)
- Automator actions for creation of complex multi-application workflows
- Support for QuickTime video formats up to HD resolutions
- Quick Look support for Soundtrack Pro Audio File Project (STAP) files
- Integrated video tab
- Output to SD and HD video monitors (via FireWire or PCI card)
- HD or SD output using Digital Cinema Desktop to second Apple Cinema Display
- Send and receive MIDI timecode and beat clock for synchronization with hardware and software
- Integration with Final Cut Pro 7, Motion 4, DVD Studio Pro 4
- Nondestructive, round-trip audio file editing with Final Cut Pro 7, Motion 4, and Logic Pro 9
- Support for Final Cut Pro 7 scoring markers
- Conform tab to conform audio edit to new Final Cut Pro 7 edits
- Conform visual interface for highlighting changed areas
- Accept or reject changes across entire project or selectively on a change-by-change basis
- Podcast track to create audio-only, enhanced audio, or video podcasts
- Support for chapter, artwork, and URL markers in video and audio podcasts
- Export presets and customizable post-export scripts
- View iXML metadata
- OMF import
- AAF import and export

## Included Effects

TS = True surround

- Dynamics
  - Adaptive Limiter
  - Compressor
  - DeEsser
  - Expander
  - Limiter TS
  - Multichannel Gain TS
  - Multipressor
  - Noise Gate
  - Surround Compressor TS
- Distortion
  - Bitcrusher
  - Clip Distortion
  - Distortion
  - Distortion II
  - Exciter
  - Overdrive
  - Phase Distortion
- EQ and Filter
  - AutoFilter
  - Channel EQ
  - Fat EQ
  - High Cut
  - High Pass Filter
  - High Shelving EQ
  - Linear Phase EQ
  - Low Cut
  - Low Pass Filter
  - Low Shelving EQ
  - Match EQ TS
  - Parametric EQ
  - Soundtrack Pro AutoFilter
- Modulation
  - Chorus
  - Ensemble TS
  - Flanger
  - Modulation Delay
  - Phaser
  - Scanner Vibrato
  - Tremolo TS
- Reverb/Delay
  - Delay Designer TS
  - PlatinumVerb
  - Soundtrack Pro Reverb
  - Space Designer TS
  - Stereo Delay
  - Tape Delay
- Metrics and Diagnostics
  - Correlation Meter
  - Multi Meter TS
  - Test Oscillator
  - Tuner TS
- Miscellaneous
  - Denoiser
  - Direction Mixer
  - Enveloper
  - Gain
  - Pitch Shifter II
  - Ringshifter
  - Spectral Gate
  - Stereo Spread
  - SubBass
  - Vocal Transformer

# Color 1.5 - Technical Specifications

## Minimum System Requirements

- Mac computer with an Intel processor
- 1GB of RAM (2GB of RAM recommended when working with compressed HD and uncompressed SD sources; 4GB of RAM recommended when working with uncompressed HD sources)
- ATI or NVIDIA graphics processor. Integrated Intel graphics processors are not supported except the Intel HD Graphics 3000.
- 128MB of VRAM
- Display with 1280-by-800 resolution or higher
- Mac OS X v10.5.6 or later
- QuickTime 7.6 or later
- DVD drive for installation
- Display with 1680-by-1050 resolution or higher; dual displays are highly recommended
- For rendering of 4K files and DPX: a graphics card with at least 512MB of VRAM
- For 32-bit rendering: a graphics card with at least 256MB of VRAM
- Three-button mouse for full functionality

## Color Grading

- Real-time grading controls for SD, HD, 2K, and 4K without proxies
- Preview full-screen playback of SD, HD, and 2K on an attached Apple Cinema or LED Cinema Display or Apple-certified third-party video card
- Workflow-oriented interface divides controls into eight separate rooms
- Primary, Secondary, and Primary Out grading functions
- Color wheels with hue, saturation, and luminance controls for highlights, midtones, and shadows
- Curves for individual adjustment to R,G,B and Luminance channels with B-spline control points
- Advanced RGB and Printer Points controls for precise film printing
- Switch between four live grades or disable grade per shot
- Copy grades to all selected shots
- Autobalance correction available in Primary room
- ASC-style Lift, Gamma, Gain controls
- Eight secondaries per shot with custom mattes, key blur, and motion tracking
- Animated circle, rectangle, and user shape Vignettes with inner and outer softness
- Keyframing with interpolation for most controls
- Color FX with node trees for compositing control
- Still Store for saving and comparing reference images
- Pan and Scan with preset aspect ratios
- Real-time waveform monitor in mV and IRE, vectorscopes and histograms
- 3D Color Space scopes for RGB, HSL, Y'CbCr, and IPT display
- Broadcast-safe limiting
- Support for 3D LUTs for display calibration and output simulation
- Multiple video tracks
- Support for third-party control surfaces with trackballs and knobs
- EDL support for linking to DPX and Cineon files
- Render directly to DPX or Cineon file formats for film out
- Use EDLs for notching QuickTime movies or sequences without XML metadata
- Render Log displays stop, start time, speed, and amount of rendering
- Relinking to RED and DPX databases with Cinema Tools and EDLs

# 638\_Color 1.5 - Technical Specifications.pdf

## Integration with Final Cut Pro 7

- Round-trip feature film-length projects between Color and Final Cut Pro 7 with Send to Color and Send to Final Cut Pro
- Round-trip support for freeze frames, still graphics, multicam, and variable speed change effect from Final Cut Pro
- Color projects configured automatically to match Final Cut Pro sequence settings
- 2K and 4K Digital Intermediate workflow from Final Cut Pro sequences
- Play back all standard frame rates and frame sizes in Color
- Display dissolves and fades in the Timeline and renders for 2K/4K DPX and Cineon output
- Round-trip Pan and Scan metadata sent from Final Cut Pro as Motion effect

## Effects

- Over 40 Color FX and over 20 premade looks
- Over 90 additional downloadable Color FX looks
- Renders at 8-bit, 10-bit, and 32-bit floating point (dependent on GPU)
- Customizable node tree for effects creation
- Copy and paste nodes in Color FX room
- Save and reuse favorite effects

## Supported Formats

- Apple ProRes family of 10-bit, full-width VBR codecs
- 4:4:4 2K and 4K as DPX or Cineon files
- Apple Uncompressed 8-bit 4:2:2
- Apple Uncompressed 10-bit 4:2:2
- TIFF, JPEG, and JPEG 2000 image sequences
- All still graphics formats supported by QuickTime 7
- Optional viewing or grading proxy creation for DPX and Cineon files
- Third-party codecs from AJA and Blackmagic Design
- RED, AVC-Intra, IMX, HDV, XDCAM HD, and XDCAM HD 422 can be graded, but must be rendered using Apple ProRes or Uncompressed codecs

## Trimming for 2K Output

- Trimming controls when rendering directly to DPX or Cineon files
- Ripple
- Roll
- Slip
- Splice
- Merge edits

Published Date: Jul 26, 2017

# Compressor 3.5 - Technical Specifications

## Minimum System Requirements

- Mac computer with an Intel processor
- 1GB of RAM (2GB of RAM recommended when working with compressed HD and uncompressed SD sources; 4GB of RAM recommended when working with uncompressed HD sources)
- ATI or NVIDIA graphics processor. Integrated Intel graphics processors are not supported except the Intel HD Graphics 3000.
- 128MB of VRAM
- Display with 1280-by-800 resolution or higher
- Mac OS X v10.5.6 or later
- QuickTime 7.6 or later
- DVD drive for installation
- For burning Blu-ray discs: a Blu-ray recorder

## High-Performance Encoding

- H.264 multi-pass encoding for Blu-ray discs and files
- Support for red laser burning of AVCHD discs for playback in compatible Blu-ray players
- H.264 for Apple devices, web, mobile devices
- HD DVD encoding for DVD Studio Pro authoring
- Support for image sequence sources: TIFF, Targa, DPX, JPEG, and OpenEXR
- Support for encoding to TIFF, Targa, DPX, JPEG, and OpenEXR image sequences
  - Full QuickTime support
  - MPEG-2 encoding
  - MPEG-1 encoding
  - MPEG-4 encoding
  - Distributed encoding with segmentation options
  - Two-pass VBR encoding for MPEG-2
  - Provides Dolby-certified encoding to Dolby Digital Professional AC-3 format
  - Accepts QuickTime (single-channel or multichannel), AIFF, Sound Designer, and WAV files
  - Advanced chaptering for Apple TV and podcasting
- Closed caption support for Apple devices, QuickTime, and MPEG-2
- Batch templates with job actions for automating workflows from encoding to delivery, including:
  - Add to iTunes Library
  - Create DVD
  - Create Blu-ray Disc
  - Create Web Reference Movie
  - Open with Application
  - Run Automator Workflow
  - Publish to YouTube
- Automatic setting creation via drag and drop of a QuickTime file
  - Scaling and down-converting
  - Standards conversions
  - Retiming
  - Preview with split-screen comparison
  - High-quality image processing
  - More than 100 presets included
  - Automated encoding with droplets
  - Automatic and custom cropping
- Automatic and custom padding
- Automatic copying of source media for reference media to encoding nodes
  - Four audio filters: dynamic range; peak limiter; Apple: AUGraphicEQ and fade in/out
  - Automatic post to FTP
  - Reverse telecine
  - Deinterlacing
- Enhanced droplets for easy desktop encoding

## Dolby Digital Professional Encoding

- Dolby-certified encoding to Dolby Digital Professional AC-3 format
- Accepts QuickTime (single-channel or multichannel), AIFF, Sound Designer, and WAV format sound files for encoding
- Support for all channel formats from mono to 5.1 surround sound
- Automatically creates 2.0 or 5.1 based on number of channels in the source media file
- Confidence decoding for preview of AC-3 files

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## Video Filters

- BlackWhite Restore
- Brightness and Contrast
- Color Correct Highlights
- Color Correct Midtones
- Color Correct Shadows
- Deinterlacing
- Fade In/Out

- Gamma Correction
- Letterbox
- Noise Removal
- Sharpen Edge
- Text Overlay
- Timecode Generator
- Watermark (Image, animated with QuickTime or Motion files)

## Audio Filters

- Dynamic Range
- Peak Limiter

- Apple: AUGraphicEQ
- Fade In/Out

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# Power Mac G4 (Mirrored Drive Doors) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Power Mac G4 (Mirrored Drive Doors) - Technical Specifications

Configurations			
Order no.	M8787LL/A	M8689LL/A	M8573LL/A
Processor	Dual 867MHz PowerPC G4	Dual 1GHz PowerPC G4	Dual 1.25GHz PowerPC G4
L3 cache	1MB DDR SRAM per processor	1MB DDR SRAM per processor	2MB DDR SRAM per processor
System bus	133MHz	167MHz	167MHz
Main memory (2GB maximum <sup>3</sup> )	256MB PC2100 (266MHz) DDR SDRAM	256MB PC2700 (333MHz) DDR SDRAM	512MB PC2700 (333MHz) DDR SDRAM
Hard drive <sup>4</sup>	60GB Ultra ATA/100; 7200 rpm	80GB Ultra ATA/100; 7200 rpm	120GB Ultra ATA/100; 7200 rpm
Optical drive	Combo (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)	SuperDrive (DVD-R/CD-RW)
Graphics support	NVIDIA GeForce4 MX with 32MB of DDR SDRAM	ATI Radeon 9000 Pro with 64MB of DDR SDRAM	ATI Radeon 9000 Pro with 64MB of DDR SDRAM
Expansion slots and bays	Four open 64-bit, 33MHz PCI slots; AGP 4X slot with graphics card installed; four internal hard drive bays (one occupied); two optical drive bays (one occupied)		
Ports	Two FireWire, four USB, front headphone minijack and speaker, rear Apple speaker minijack, audio line in, audio line out, ADC and DVI connectors for dual display support		
Networking	Built-in 10/100/1000BASE-T Ethernet and 56K modem <sup>6</sup> ; AirPort ready <sup>5</sup>		
Software	Mac OS X, Mac OS 9, QuickTime, iChat, iMovie, iPhoto, iTunes, iDVD (requires SuperDrive), DVD Player, Mac OS X Mail, Microsoft Internet Explorer, EarthLink (includes 30 days of free service), Acrobat Reader, Art Director's Toolkit, FAXstf, FileMaker Pro Trial, Graphic Converter, OmniGraffle, OmniOutliner, PixelNance, Snapz Pro, Developer Tools		
Service and support	90 days of free telephone support and one-year limited warranty		
Included	Apple Pro Keyboard, Apple Pro Mouse, DVI to VGA adapter, modem cable		

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is provided on CD-ROM.

Options	
Processor	Dual 867MHz, dual 1GHz, dual 1.25GHz
Memory	(PC2100 or PC2700 DDR SDRAM): 256MB, 512MB, 1GB, 1.5GB, 2GB
Hard drives	60GB Ultra ATA/100 (7200 rpm), 80GB Ultra ATA/100 (7200 rpm), 120GB Ultra ATA/100 (7200 rpm), 36GB Ultra160 SCSI (10,000 rpm), 72GB Ultra160 SCSI (10,000 rpm) <sup>4</sup>
Optical drives	SuperDrive (DVD-R/CD-RW), Combo drive (DVD-ROM/CD-RW)
Graphics	NVIDIA GeForce4 MX with 32MB DDR SDRAM, ATI Radeon 9000 Pro with 64MB DDR SDRAM, NVIDIA GeForce4 Ti with 128MB DDR SDRAM
Audio	Apple Pro Speakers, Apple iPod, Harman Kardon iSub, Harman Kardon SoundSticks
Other	AirPort Card, AirPort Base Station, Ultra SCSI PCI card, Ultra160 SCSI PCI card, Bluetooth adapter, DVD-R Media Kit

## Technical Specifications



Processing and memory

- Dual 867MHz, 1GHz, or 1.25GHz PowerPC G4 processors
- Velocity Engine vector processing unit
- Full 128-bit internal memory data paths
- Powerful floating-point unit supporting single-cycle, double-precision calculations
- Data stream prefetching operations supporting four simultaneous 32-bit data streams
- 256K on-chip L2 cache running at processor speed
- Up to 2MB DDR SRAM L3 cache per processor with up to 4-GBps throughput
- Up to 167MHz system bus supporting over 1.3-GBps data throughput
- 256MB or 512MB of PC2100 or PC2700 DDR SDRAM main memory supporting up to 2.7-GBps throughput
- Four DIMM slots supporting up to 2GB of DDR SDRAM using one of the following<sup>3</sup>:
  - 256MB DIMMs (64-bit-wide, 128-Mbit)
  - 512MB DIMMs (64-bit-wide, 256-Mbit)

Graphics and display support

- One of the following graphics cards installed in a dedicated AGP 4X graphics slot:
  - NVIDIA GeForce4 MX graphics card with 32MB of DDR SDRAM
  - ATI Radeon 9000 Pro graphics card with 64MB of DDR SDRAM
  - NVIDIA GeForce4 Ti graphics card with 128MB of DDR SDRAM (build-to-order option)
- Support for digital resolutions up to 1920 by 1200 pixels and analog resolutions up to 1600 by 1200 pixels
- ADC and DVI connectors; DVI to VGA adapter included
- Dual display support for extended desktop and video mirroring modes
- Support for up to two Apple displays

Storage and expansion

- Four 3.5-inch hard drive expansion bays
  - One 7200-rpm Ultra ATA/100 drive preinstalled in standard configurations: 60GB, 80GB, or 120GB<sup>4</sup>
  - Support for up to four internal ATA drives (two Ultra ATA/100 and two Ultra ATA/66)
  - Support for up to four internal SCSI drives (requires PCI SCSI card, sold separately)
  - Support for a combination of internal ATA and SCSI drives (total of four)
- One of the following optical drives:
  - SuperDrive (DVD-R/CD-RW); writes DVD-R discs at 2x speed, reads DVDs at 6x speed, writes CD-R discs at 8x speed, writes CD-RW discs at 4x speed, reads CDs at 24x speed
  - Combo drive (DVD-ROM/CD-RW); reads DVDs at 8x speed, writes CD-R discs at 16x speed, writes CD-RW discs at 10x speed, reads CDs at 32x speed
  - Optional Combo drive in second optical drive bay
- Four open full-length 64-bit, 33MHz PCI slots
- One AGP 4X slot with graphics card installed

Communications

- 10/100/1000BASE-T Ethernet connector (RJ-45)
- Built-in antennas and card slot for optional 11-Mbps AirPort Card; IEEE 802.11b compliant<sup>5</sup>
- Built-in 56K V.92 modem<sup>6</sup>

Peripherals and audio

- Two 400-Mbps FireWire ports<sup>7</sup> (15W total power)
- Four USB ports (two on system, two on keyboard)
- Front headphone jack
- Built-in speaker
- Stereo audio line in and line out minijacks
- Apple speaker minijack for connection to optional Apple Pro Speakers

Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100–125V AC or 200–240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum current: 6.5A (low-voltage range) or 7.5A (high-voltage range)
- Operating temperature: 50&def; to 95&def; F (10&def; to 35&def; C)
- Storage temperature: –40&def; to 116&def; F (–40&def; to 47&def; C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

Size and weight

- Height: 17.0 inches (43.2 cm)
- Width: 8.9 inches (22.7 cm)
- Depth: 18.4 inches (46.8 cm)
- Weight: 42 pounds (19.1 kg)<sup>8</sup>

1. Second Apple flat-panel display requires the Apple DVI to ADC Adapter, sold separately.

2. Selected models.

3. 999MB maximum per application in Mac OS 9.

4. 1GB = 1 billion bytes; actual formatted capacity less.

5. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.

6. Appropriate ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.

7. Actual rates will vary.

8. Weight varies by configuration and manufacturing process.

# DVD Studio Pro 4 - Technical Specifications

<b>Minimum System Requirements</b>	<ul style="list-style-type: none"> <li>• Mac computer with an Intel processor</li> <li>• 1GB of RAM (2GB of RAM recommended when working with compressed HD and uncompressed SD sources; 4GB of RAM recommended when working with uncompressed HD sources)</li> <li>• ATI or NVIDIA graphics processor. Integrated Intel graphics processors are not supported except the Intel HD Graphics 3000.</li> <li>• 128MB of VRAM</li> <li>• Display with 1280-by-800 resolution or higher</li> <li>• Mac OS X v10.5.6 or later</li> </ul>	<ul style="list-style-type: none"> <li>• QuickTime 7.6 or later</li> <li>• DVD drive for installation</li> <li>• For writing finished projects to disc: an Apple SuperDrive or other DVD recorder</li> <li>• For writing finished projects to a double-layer disc: a double-layer-compatible recorder and double-layer media</li> <li>• For transporting projects that contain copy-protection or dual-layer features to a replicator: a DLT drive, external drive, or Internet transfer of the project's disk image</li> </ul>
<b>Graphical View</b>	<ul style="list-style-type: none"> <li>• View flow of DVD graphically</li> <li>• Print or save to PDF</li> <li>• Use Macro view to navigate easily through large projects</li> </ul>	<ul style="list-style-type: none"> <li>• Flag elements for more attention</li> <li>• Fit all elements in window, zoom in/out</li> <li>• Organize tiles with Auto layout command</li> </ul>
<b>Transitions</b>	<ul style="list-style-type: none"> <li>• Add transitions to menus, menu buttons, slideshows, and timeline-based stills</li> <li>• Choose from more than 30 prebuilt transitions such as Blur, Dissolve, Droplet, Fade through Color, Melt, Motion Dissolve, Rotate, Rotation Blur, and Zoom</li> </ul>	<ul style="list-style-type: none"> <li>• Create additional Alpha transitions</li> </ul>
<b>Jacket Picture</b>	<ul style="list-style-type: none"> <li>• Shows picture of choice when user stops playback of DVD on supported DVD players</li> </ul>	<ul style="list-style-type: none"> <li>• Creates all necessary files for jacket picture from any popular image formats</li> </ul>
<b>Automatic MPEG-2 Encoding</b>	<ul style="list-style-type: none"> <li>• Encode video in the background while you work or while building the DVD</li> <li>• One- and two-pass variable bit rate (VBR) encoding for MPEG-2</li> <li>• Three levels of motion estimation</li> <li>• Support for PAL and NTSC formats</li> </ul>	<ul style="list-style-type: none"> <li>• Support for 4:3 and 16:9 aspect ratios</li> <li>• DVD-compliant MPEG-2 streams from other encoders accepted</li> <li>• More advanced encoding options provided via Compressor (included)</li> </ul>
<b>Asset Management</b>	<ul style="list-style-type: none"> <li>• Organize assets with folders</li> <li>• Open in Editor</li> <li>• View status of background encoding</li> <li>• View information on imported assets such as type, timestamps, length, encoding progress, bit rate, and more</li> </ul>	<ul style="list-style-type: none"> <li>• Reveal the location of the asset in the Finder</li> <li>• Sort by name and information</li> <li>• Refresh assets that may have been updated with other applications</li> <li>• Re-encode source assets</li> <li>• Reconnect assets</li> </ul>
<b>Advanced Interactivity</b>	<ul style="list-style-type: none"> <li>• Multistory feature for creating alternative versions (up to 98 stories)</li> <li>• DVD-ROM functionality using DVD@CCESS (for computer playback only); DVD-ROM input includes the ability to add photos, PDFs, or direct links to websites</li> <li>• Control actions for remote control buttons, including number offset</li> </ul>	<ul style="list-style-type: none"> <li>• Enable/Disable user operations</li> <li>• Specify actions for First Play, Title button, Menu button, end jumps, pre-scripts, pre-script targets, Angle button, Chapter button, Audio button, Subtitle, and Return</li> </ul>

# 640\_DVD Studio Pro 4 - Technical Specifications.pdf

## Pre-mastering Options

- Region encoding
- Industry-standard analog and digital copyright management with Macrovision (Types 1, 2, and 3) and CSS for SD projects<sup>1</sup>
- Test functionality with built-in Simulator
- Test built projects with Apple DVD Player software
- Allows burning first layer of DVD-9 project to DVD-5 media for testing
- Supports 12- and 8-cm discs, single and double layer
- Dual-layer options:
  - Choose between Parallel Track Path (PTP) and Opposite Track Path (OTP)
  - Specify the dual-layer break point
  - Specify a non-seamless or seamless dual-layer break point
- Format existing builds to DVD-R and DLT
- Burn DVD-9 projects to double-layer media for testing
- Replication to red laser media
- Replication to blue laser media (for HD DVD)

## Import

- Maintains named chapter markers from Final Cut Pro, Final Cut Express, and iMovie
- DVD Studio Pro 2 and 3 projects
- iDVD 3 and 4 projects
- AIFF
- AVI
- BMP
- DV
- JPEG
- Macromedia Flash 5
- MPEG-1
- MP3 (MPEG-1 Layer 3)
- MPEG-2
- M4A, M4P (iTunes 4 audio)
- PDF (Mac OS X)
- Photoshop (with layers)
- PICT
- PNG
- Targa
- TIFF
- WAV
- Aspect ratios: 4:3 and 16:9
- TV systems: PAL and NTSC
- Frame rates: 29.97 fps (NTSC) and 25 fps (PAL)
- Maximum GOP sizes: 18 frames (NTSC), 15 frames (PAL)
- All QuickTime supported codecs — encoded to MPEG-2 (SD or HD DVD)
- H.264 and HDV (supported natively in HD DVD projects)

## Audio Formats

- STAP (Soundtrack audio file) support
- MPEG-1 Layer 2 (64 to 384 Kbps)
- Dolby Digital AC-3 (mono to 5.1 surround using 64 to 448 Kbps)
- DTS — mono to 5.1 surround at 48kHz; DTS ES — 6.1 at 96kHz at 754 Kbps or 1509 Kbps
- Stereo PCM (16 bit/48kHz at 1536 Kbps)
- Stereo PCM (24 bit/96kHz at 4608 Kbps)
- Other QuickTime audio formats automatically transcoded to AIFF/PCM

## DVD Standards

- Author traditional DVDs using SD assets
- Author HD DVDs using SD and HD assets

## Output Formats

- DVD-R, DVD-RW, DVD+R, DVD+RW, double-layer media
- Double-layer media support
- DLT drive (required for DVD-9 projects)
- DDP 2.0 and 2.1
- CMF 1.0
- CMF 2.0
- DDP 3.0
- Disk Image
- Video\_TS to hard drive
- HVDVD\_TS to hard drive

# 640\_DVD Studio Pro 4 - Technical Specifications.pdf

<b>Menus</b>	<ul style="list-style-type: none"><li>• Choose from a wide variety of automatic transitions</li><li>• Create your own transitions</li><li>• Includes several theme-based royalty-free Apple-designed templates that can be user-customized</li><li>• Supports up to 36 buttons per menu (18 for 16:9 aspect ratio)</li><li>• Templates in both NTSC and PAL formats</li><li>• Allows still menus and buttons to be made from layered Photoshop files</li></ul>	<ul style="list-style-type: none"><li>• Allows motion menus to be made from video streams</li><li>• Set the loop point on motion menus to avoid replaying intro transition</li><li>• Add effects to menus and buttons with shapes and drop zones</li><li>• Built-in action-safe and title-safe areas</li><li>• View menus with rectangular or square pixels</li><li>• Use grayscale and chroma color mapping</li><li>• Create language-localized versions of the same menu</li></ul>
<b>Connections</b>	<ul style="list-style-type: none"><li>• Automatically assign functionality to assets with one click using over 60 combinations of context-sensitive drop palettes</li></ul>	<ul style="list-style-type: none"><li>• Automatically create movie scene indexes based on chapter markers</li></ul>
<b>User Interface</b>	<ul style="list-style-type: none"><li>• Mode-free interface for workflow efficiency</li><li>• Rearrange interface tabs to different quadrants to create different workflows</li></ul>	<ul style="list-style-type: none"><li>• Save user-defined workspace configurations (three preset configurations)</li><li>• Customizable toolbar</li></ul>
<b>Timeline</b>	<ul style="list-style-type: none"><li>• Manage up to 9 video angles, 8 audio streams, and 32 subtitle streams per track</li><li>• Add, modify, and delete chapter markers in the Timeline</li><li>• Trim audio and video clips interactively or with timecode</li><li>• Combine multiple video clips and slides into one track</li><li>• Stills in Timeline are added to DVD as space-saving stills, not generated video</li></ul>	<ul style="list-style-type: none"><li>• Add up to 99 tracks in a project</li><li>• Import Line 21 files for closed caption support, for NTSC SD projects only</li><li>• Two types of angles:<ul style="list-style-type: none"><li>◦ Multiple angles add another full-length segment to track</li><li>◦ Mixed angles add only video that is different from the first video angle</li></ul></li></ul>
<b>Subtitling</b>	<ul style="list-style-type: none"><li>• Integrated subtitle</li><li>• Add up to 32 subtitle streams per track</li><li>• Set position, font, size, style, and color, fade in and fade out</li><li>• Enter timecode or drag in Timeline to set start, stop, and duration</li></ul>	<ul style="list-style-type: none"><li>• View built-in title-safe and action-safe areas</li><li>• Use graphics in subtitles</li><li>• Import subtitles in .son, .stl, .txt, and .scr formats</li><li>• Use buttons over video</li></ul>
<b>Slideshows</b>	<ul style="list-style-type: none"><li>• Choose from a wide variety of automatic transitions</li><li>• Create your own transitions</li><li>• Fit slideshow to audio</li><li>• Apply audio to individual slides</li></ul>	<ul style="list-style-type: none"><li>• Convert slideshow to a track</li><li>• Set a slide duration or choose manual advance</li><li>• Use PSD (8-bit RGB), TIFF, JPEG, BMP, Targa, PICT, and any other QuickTime-based image format</li></ul>
<b>VTS Editor</b>	<ul style="list-style-type: none"><li>• Automatic allocation of project's assets to VTS folders</li><li>• Automatic placement of menu's assets into VTS folders</li></ul>	<ul style="list-style-type: none"><li>• Manually move elements between multiple VTS folders</li><li>• Up to 99 VTS folders per project</li></ul>
<b>Scripting</b>	<ul style="list-style-type: none"><li>• Jump to motion menu loop point</li><li>• Advanced scripting controls to program the DVD to play back from the correct location on the disc; switch audio, video, and subtitle streams depending on context; and temporarily change parental controls</li><li>• Access to 8 GPRMs with partition options to 112</li><li>• Add pre-script commands to menus, tracks, and slideshows</li></ul>	<ul style="list-style-type: none"><li>• Use up to 124 commands per script</li><li>• 10 scripting commands, including Jump, Set GPRM, Goto Set System Stream, Resume, GPRM mode, Exit, Exit Pre-script, and Jump Indirect</li><li>• Machine-level control</li><li>• View values of GPRM and SPRM registers in Simulator</li><li>• Bit-wise operations</li></ul>

1. Copy protection requires that you output your project to a replicator. Macrovision requires that users work with a Macrovision-certified replication facility or execute a Macrovision usage agreement. Check with your replicator for costs and minimum quantities.

Published Date: Jul 26, 2017

# Final Cut Studio (2009) - Technical Specifications

Final Cut Studio (2009) - Part Numbers	
Retail	<b>MB642Z/A</b>
Upgrade	<b>MB643Z/A</b>
Academic	<b>MB647Z/A</b>

## Additional Information

- [Final Cut Pro 7 - Technical Specifications](#)
- [DVD Studio Pro 4 - Technical Specifications](#)
- [Motion 4 - Technical Specifications](#)
- [Compressor 3.5 - Technical Specifications](#)
- [Soundtrack Pro 3 - Technical Specifications](#)
- [Color 1.5 - Technical Specifications](#)

## Requirements to install all Final Cut Studio applications

- Mac computer with an Intel processor
- 1GB of RAM (2GB of RAM recommended when working with compressed HD and uncompressed SD sources; 4GB of RAM recommended when working with uncompressed HD sources)
- ATI or NVIDIA graphics processor. Integrated Intel graphics processors are not supported except the Intel HD Graphics 3000.
- 128MB of VRAM
- Display with 1280-by-800 resolution or higher
- Mac OS X v10.5.6 or later
- QuickTime 7.6 or later
- DVD drive for installation

## Available Disk Space

- 4GB of disk space required to install all applications (Final Cut Pro, Color, DVD Studio Pro, Soundtrack Pro, Motion, Cinema Tools, Compressor, and Apple Qmaster)
- 46GB of disk space required for optional content
- 9GB for DVD Studio Pro content
- 7GB for Motion templates
- 22GB for audio content
- 8GB for LiveFonts

## Soundtrack Pro - Specific Requirements

- For 5.1 surround monitoring of multichannel audio content: an audio interface with a minimum of six outputs
- For multitrack recording: an audio interface with multiple inputs

## Color - Specific Requirements

- Display with 1680-by-1050 resolution or higher; dual displays are highly recommended
- For rendering of 4K files and DPX: a graphics card with at least 512MB of VRAM
- For 32-bit rendering: a graphics card with at least 256MB of VRAM
- Three-button mouse for full functionality

## DVD Studio Pro - Specific Requirements

- For writing finished projects to disc: an Apple SuperDrive or other DVD recorder
- For writing finished projects to a double-layer disc: a double-layer-compatible recorder and double-layer media
- For transporting projects that contain copy-protection or dual-layer features to a replicator: a DLT drive, external drive, or Internet transfer of the project's disk image

## Blu-ray - Specific Requirements

- For burning Blu-ray discs: a Blu-ray recorder

# Apple Thunderbolt Display - Technical Specifications

27-inch (diagonal viewable image size) thin film transistor (TFT) active-matrix liquid crystal display (LCD) with in-plane switching (IPS)

- Display**

27 inches of high-resolution screen space.
- *Resolution:* 2560 by 1440 pixels
  - *Colors (maximum):* 16.7 million
  - *Aspect ratio:* 16:9
  - *Viewing angle:* 178° horizontal; 178° vertical
  - *Brightness:* 375 cd/m2
  - *Contrast ratio:* 1000:1
  - *Response time:* 12 ms

*Height:* 19.35 inches (49.1 cm)

- Size and Weight**

Big screen. Small footprint.
- Width:* 25.7 inches (65 cm)

*Depth (with stand):* 8.15 inches (20.7 cm)

*Weight:* 23.5 pounds (10.8 kg)<sup>1</sup>

## Cables

- Cables and Peripheral Connections**

Create a powerful docking station without a lot of clutter.
- Built-in Thunderbolt cable
  - Built-in Universal MagSafe cable (up to 85W)

### Peripheral connections

- Three powered USB 2.0 ports
- FireWire 800 port
- Gigabit Ethernet port
- Thunderbolt port
- Kensington security slot

## Audio and Video

- Everything you need to make video calls and play music, movies, and games.

  - Built-in FaceTime HD camera with microphone
  - Built-in 2.1 speaker system (49 watts)

- System Requirements**
- Thunderbolt-enabled Mac computer, including MacBook Air, MacBook Pro, Mac mini, and iMac
  - OS X v10.6.8 or later

- Electrical and Operating Requirements**
- Input voltage: 100-240V AC; 50-60Hz
  - Maximum power: 250W (Thunderbolt Display while charging MacBook Pro)
  - Energy saver mode: 2W or less
  - Operating temperature: 50° to 95° F (10° to 35° C)
  - Storage temperature: -4° to 116° F (-20° to 47° C)
  - Operating humidity: 20% to 80% noncondensing
  - Maximum operating altitude: 10,000 feet

# 642\_Apple Thunderbolt Display - Technical Specifications.pdf

## Limited Warranty and Service

Your Apple Thunderbolt Display comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your display's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

## In the Box

- Apple Thunderbolt Display
- AC power cord
- Printed documentation

## Additional Options

- VESA Mount Adapter Kit
- [AppleCare Protection Plan](#)

## Apple Thunderbolt Display and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more on the Apple Environment site](#)

[View a PDF of Apple's Environmental Status Report for Apple Thunderbolt Display](#)

**The Apple Thunderbolt Display is designed with the following features to reduce its environmental impact:**

- Lead-free
- BFR-free
- PVC-free<sup>2</sup>
- Mercury-free
- Arsenic-free glass
- Meets ENERGY STAR 5.1 requirements
- Rated EPEAT Gold<sup>3</sup>

## Apple and the Environment

[Learn more about Apple's dedication to reducing the environmental impact of our products and process.](#) Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Apple display.](#)

## Thunderbolt-Enabled Mac Computers

- [MacBook Air](#)
- [MacBook Pro](#)
- [iMac](#)
- [Mac mini](#)

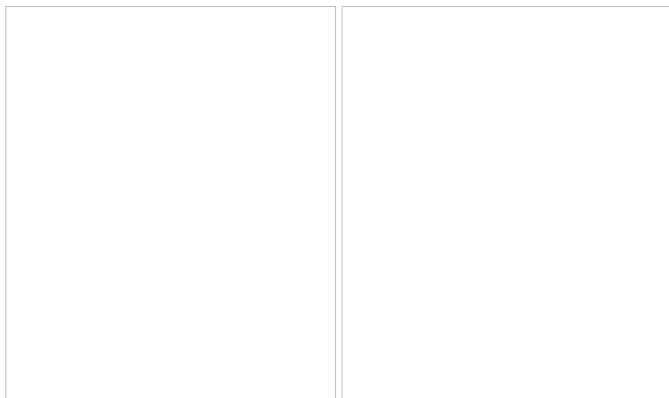
- 
1. Weight varies by configuration and manufacturing process.
  2. PVC-free AC power cord available in the United States, Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  3. Thunderbolt Display achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Sep 16, 2011



# iPhone 4S - Technical Specifications

## Color



- White
- Black

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB

## Size and Weight<sup>2</sup>

- Height: 4.5 inches (115.2 mm)
- Width: 2.31 inches (58.6 mm)
- Depth: 0.37 inch (9.3 mm)
- Weight: 4.9 ounces (140 grams)

## Cellular and Wireless

- World phone
- UMTS/HSDPA/HSUPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
- CDMA EV-DO Rev. A (800, 1900 MHz)<sup>3</sup>
- 802.11b/g/n Wi-Fi (802.11n 2.4GHz only)
- Bluetooth 4.0 wireless technology

## Location

- Assisted GPS
- Digital compass
- Wi-Fi
- Cellular

## Display

- Retina display
- 3.5-inch (diagonal) widescreen Multi-Touch display
- 960-by-640-pixel resolution at 326 ppi
- 800:1 contrast ratio (typical)
- 500 cd/m<sup>2</sup> max brightness (typical)
- Fingerprint-resistant oleophobic coating on front and back
- Support for display of multiple languages and characters simultaneously

## Camera, Photos, and Video

- 8-megapixel camera
- Autofocus

# 643\_iPhone 4S - Technical Specifications.pdf

- Tap to focus
- Face detection in still images
- LED flash
- Video recording, HD (1080p) up to 30 frames per second with audio
- Video stabilization
- Front camera with VGA-quality photos and video at up to 30 frames per second
- Photo and video geotagging

## Power and Battery<sup>4</sup>

- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter
- Talk time: Up to 8 hours on 3G, up to 14 hours on 2G (GSM)
- Standby time: Up to 200 hours
- Internet use: Up to 6 hours on 3G, up to 9 hours on Wi-Fi
- Video playback: Up to 10 hours
- Audio playback: Up to 40 hours

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum [volume limit](#)

## TV and Video

- AirPlay Mirroring to Apple TV support at 720p
- AirPlay video streaming to Apple TV (3rd generation) at up to 1080p and Apple TV (2nd generation) at up to 720p
- Video mirroring and video out support: Up to 1080p with Apple Digital AV Adapter or Apple VGA Adapter (adapters sold separately)
- Video out support at 576p and 480p with Apple Component AV Cable; 576i and 480i with Apple Composite AV Cable (cables sold separately)
- Video formats supported: H.264 video up to 1080p, 30 frames per second, High Profile level 4.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Headphones

- Apple Earphones with Remote and Mic
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Mail Attachment Support

### Viewable Document Types

.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel)

## Sensors

- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>5</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X v10.6.8 or later
  - PC: Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later

# 643\_iPhone 4S - Technical Specifications.pdf

- iTunes 10.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

### Language Support

English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### Keyboard Support

English (U.S.), English (UK), Chinese - Simplified (Handwriting, Pinyin, Wubihua), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Wubihua), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Tibetan, Turkish, Ukrainian, Vietnamese

### Dictionary Support (enables predictive text and autocorrect)

English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, French (Canadian), French (Switzerland), German, Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Indonesian, Latvian, Lithuanian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### Siri Languages

English (U.S., UK, and Australian), French, German

## In the Box

- iPhone 4S
- Apple Earphones with Remote and Mic
- Dock Connector to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iPhone 4S embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:**

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC free
- Majority of packaging made from post-consumer recycled fiberboard and biobased materials
- Power adapter outperforms strictest global energy efficiency standards

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPhone.

## Accessories

# 643\_iPhone 4S - Technical Specifications.pdf

## Apple In-Ear Headphones with Remote and Mic

Engineered for extreme clarity and audio accuracy, these headphones let you hear musical details you've been missing. [View](#)

## Apple USB Power Adapter

Use this ultracompact USB-based adapter to charge your iPhone whenever it's not connected to a computer. [View](#)

## Apple iPhone Bumpers

Made of durable rubber and molded plastic, the two-tone iPhone Bumper fits snugly around the edges of iPhone 4S and iPhone 4. And adds a splash of color. [View](#)

## Other Accessories

- iPhone 4 Dock
- iPhone 4 Dock Inserts
- Apple Dock Connector to USB Cable
- Apple Earphones with Remote and Mic
- Apple Digital AV Adapter
- Apple VGA Adapter
- iPhone TTY Adapter
- Apple Component AV Cable
- Apple Composite AV Cable
- AirPort Extreme Base Station
- Nike + iPod Sensor
- World Travel Adapter Kit

[See more accessories in the Apple Online Store](#)

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1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Actual size and weight vary by configuration and manufacturing process.
3. CDMA available only if iPhone 4S is sold and activated for use on a CDMA network.
4. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery](http://www.apple.com/iphone/battery) for more information.
5. Wireless broadband recommended; fees may apply

Some features, applications, and services are not available in all areas. See your carrier for details. Application availability and pricing are subject to change.

Published Date: Aug 15, 2014

# MacBook Pro (15-inch, Late 2011) - Technical Specifications

## Size and weight

- Height: 0.95 inch (2.41 cm)
- Width: 14.35 inches (36.4 cm)
- Depth: 9.82 inches (24.9 cm)
- Weight: 5.6 pounds (2.54 kg)<sup>1</sup>

## Connections and expansion



- MagSafe power port
- Gigabit Ethernet port
- FireWire 800 port (up to 800 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)
- Thunderbolt port (up to 10 Gbps)
- Audio line in
- Audio line out
- SDXC card slot
- Kensington lock slot

## Communications

- Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Stereo speakers with subwoofers
- Omnidirectional microphone (located under left speaker grille)
- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- Support for Apple iPhone headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Energy Efficient Ethernet
- Reduced packaging volume
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>4</sup>

## Display

- 15.4-inch (diagonal) LED-backlit glossy or optional antiglare widescreen display with support for millions of colors
- **Supported resolutions:** 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

- AMD Radeon HD 6750M graphics processor with 512MB of GDDR5 memory on 2.2GHz configuration; or AMD Radeon HD 6770M graphics processor with 1GB of GDDR5 memory on 2.4GHz configuration
- Intel HD Graphics 3000 with 384MB of DDR3 SDRAM shared with main memory<sup>5</sup>
- Automatic graphics switching

# 644\_MacBook Pro (15-inch, Late 2011) - Technical Specifications.pdf

- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- FaceTime HD camera
- Thunderbolt port

## Thunderbolt digital video output

- Native Mini DisplayPort output
- DVI output using Mini DisplayPort to DVI Adapter (optional)
- VGA output using Mini DisplayPort to VGA Adapter (optional)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)
- HDMI audio and video output using a third-party Mini DisplayPort to [HDMI Adapter](#)

## Input

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.2GHz or 2.4GHz quad-core Intel Core i7 processor with 6MB shared L3 cache; or optional 2.5GHz quad-core Intel Core i7 processor with 8MB shared L3 cache
- 4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 memory; two SO-DIMM slots support up to 8GB

## Storage

- 500GB or 750GB 5400-rpm Serial ATA hard drive; optional 750GB 5400-rpm hard drive, 750GB 7200-rpm hard drive, or 128GB, 256GB, or 512GB solid-state drive<sup>6</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>7</sup>

- up to **7 hrs** wireless web
- Built-in 77.5-watt-hour lithium-polymer battery
- 85W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	2.4 GHz	2.2 GHz	2.4 GHz	2.2 GHz
Idle	2.8	3.0	16	20
Hard drive accessing	2.8	3.0	16	20
CD drive accessing	3.5	3.5	26	27

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).

# 644\_MacBook Pro (15-inch, Late 2011) - Technical Specifications.pdf

2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## What's in the box

- MacBook Pro
- Display cleaning cloth
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

## Software

- OS X Lion (includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more)
- iLife (includes iPhoto, iMovie, and GarageBand)

## 15-inch Configurations

	2.2GHz MacBook Pro (MD318LL/A)	2.4GHz MacBook Pro (MD322LL/A)
Enclosure	Precision aluminum unibody	
Processor	2.2GHz quad-core Intel Core i7	2.4GHz quad-core Intel Core i7
L3 cache	6MB shared	6MB shared
Memory	4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 SDRAM; supports up to 8GB	
Hard drive <sup>6</sup>	500GB Serial ATA; 5400 rpm	750GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
Graphics	Intel HD Graphics 3000 <sup>5</sup> and AMD Radeon HD 6750M with automatic graphics switching	Intel HD Graphics 3000 <sup>5</sup> and AMD Radeon HD 6770M with automatic graphics switching
Graphics memory	512MB GDDR5	1GB GDDR5
Video	FaceTime HD camera; Thunderbolt port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)	
Display	15.4-inch (diagonal) LED-backlit glossy widescreen display, 1440-by-900 resolution	
Expansion	One Thunderbolt port (up to 10 Gbps), one FireWire 800 port (up to 800 Mbps), two USB 2.0 ports (up to 480 Mbps), SDXC card slot	
Audio	Stereo speakers with subwoofers, omnidirectional microphone, audio line in minijack (digital/analog), audio line out/headphone minijack (digital/analog)	
Networking	10/100/1000BASE-T (Gigabit) Ethernet	
Wireless	Wi-Fi (based on IEEE 802.11n specification) <sup>2</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology	
Hardware accessories	85W MagSafe Power Adapter, AC wall plug, power cord	
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the <a href="#">AppleCare Protection Plan</a> provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	
Apple and the global environment	<a href="#">Learn more</a> about Apple's dedication to reducing the environmental impact of our products and processes. <a href="#">Apple Product Environmental Reports</a> detail the environmental attributes of our products.	
Recycling	Apple takes a holistic view of materials management and waste minimization. <a href="#">Learn more</a> about how to recycle your Mac.	

## Options

### [Time Capsule](#)

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 2TB or 3TB server-grade hard drive
- Wi-Fi Certified for 802.11n 2.0
- USB port for connecting a USB printer or USB external hard drive

## Configure to order

# 644\_MacBook Pro (15-inch, Late 2011) - Technical Specifications.pdf

- 750GB (5400-rpm) hard drive
- 750GB (7200-rpm) hard drive
- 128GB, 256GB, or 512GB solid-state drive
- Up to 8GB of 1333MHz DDR3 SDRAM
- 1680-by-1050 high-resolution glossy display
- 1680-by-1050 high-resolution antiglare display
- Apple Remote
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan

## Accessories

- Apple Thunderbolt Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Magic Mouse
- Apple Keyboard with Numeric Keypad
- Apple Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.
  5. Memory available to OS X may vary depending on graphics needs. Minimum graphics memory usage is 384MB.
  6. 1GB=1 billion bytes; actual formatted capacity less.
  7. Wireless web testing conducted by Apple in October 2011 using preproduction 2.4GHz quad-core Intel Core i7-based 15-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

Published Date: Sep 17, 2012



# MacBook Pro (13-inch, Late 2011) - Technical Specifications

## Size and weight

- Height: 0.95 inch (2.41 cm)
- Width: 12.78 inches (32.5 cm)
- Depth: 8.94 inches (22.7 cm)
- Weight: 4.5 pounds (2.04 kg)<sup>1</sup>

## Connections and expansion



- MagSafe power port
- Gigabit Ethernet port
- FireWire 800 port (up to 800 Mbps)
- Two USB 2.0 ports (up to 480 Mbps)
- Thunderbolt port (up to 10 Gbps)
- Audio in/out
- SDXC card slot
- Kensington lock slot

## Communications

- Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Stereo speakers with subwoofer
- Omnidirectional microphone
- Combined headphone/line in (supports digital output)
- Support for Apple iPhone headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Energy Efficient Ethernet
- Reduced packaging volume
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>4</sup>

## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- **Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

- Intel HD Graphics 3000 with 384MB of DDR3 SDRAM shared with main memory<sup>5</sup>
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- FaceTime HD camera
- Thunderbolt port

Thunderbolt digital video output

- Native Mini DisplayPort output
- DVI output using Mini DisplayPort to DVI Adapter (optional)
- VGA output using Mini DisplayPort to VGA Adapter (optional)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)
- HDMI audio and video output using a third-party Mini DisplayPort to [HDMI Adapter](#)

Input

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

Processor and memory

- 2.4GHz dual-core Intel Core i5 processor with 3MB shared L3 cache or 2.8GHz dual-core Intel Core i7 processor with 4MB shared L3 cache
- 4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 memory; two SO-DIMM slots support up to 8GB

Storage

- 500GB or 750GB 5400-rpm Serial ATA hard drive; optional 750GB 5400-rpm hard drive or 128GB, 256GB, or 512GB solid-state drive<sup>6</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

Battery and power<sup>7</sup>

- up to 7 hrs wireless web
- Built-in 63.5-watt-hour lithium-polymer battery
- 60W MagSafe Power Adapter with cable management system
- MagSafe power port

Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	2.8 GHz	2.4 GHz	2.8 GHz	2.4 GHz
Idle	3.0	2.8	18	18
Hard drive accessing	3.0	2.8	18	17
CD drive accessing	3.4	3.3	29	28

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

What’s in the box

# 645\_MacBook Pro (13-inch, Late 2011) - Technical Specifications.pdf

- MacBook Pro
- Display cleaning cloth
- 60W MagSafe Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

## Software

- OS X Lion (includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more)
- iLife (includes iPhoto, iMovie, and GarageBand)

## 13-inch Configurations

	2.4GHz MacBook Pro (MD313LL/A)	2.8GHz MacBook Pro (MD314LL/A)
Enclosure	Precision aluminum unibody	
Processor	2.4GHz dual-core Intel Core i5	2.8GHz dual-core Intel Core i7
L3 cache	3MB shared	4MB shared
Memory	4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 SDRAM; supports up to 8GB	
Hard drive <sup>6</sup>	500GB Serial ATA; 5400 rpm	750GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)	
Graphics	Intel HD Graphics 3000 processor with 384MB of DDR3 SDRAM shared with main memory <sup>5</sup>	
Video	FaceTime HD camera; Thunderbolt port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)	
Display	13.3-inch (diagonal) LED-backlit glossy widescreen display, 1280-by-800 resolution	
Expansion	One Thunderbolt port (up to 10 Gbps), one FireWire 800 port (up to 800 Mbps), two USB 2.0 ports (up to 480 Mbps), SDXC card slot	
Audio	Stereo speakers with subwoofer, omnidirectional microphone, combined headphone/line in (supports digital output)	
Networking	10/100/1000BASE-T (Gigabit) Ethernet	
Wireless	Wi-Fi (based on IEEE 802.11n specification) <sup>2</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology	
Hardware accessories	60W MagSafe Power Adapter, AC wall plug, power cord	
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	
Apple and the global environment	<a href="#">Learn more</a> about Apple's dedication to reducing the environmental impact of our products and processes. <a href="#">Apple Product Environmental Reports</a> detail the environmental attributes of our products.	
Recycling	Apple takes a holistic view of materials management and waste minimization. <a href="#">Learn more</a> about how to recycle your Mac.	

## Options

### [Time Capsule](#)

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 2TB or 3TB server-grade hard drive
- Wi-Fi Certified for 802.11n 2.0
- USB port for connecting a USB printer or USB external hard drive

## Configure to order

- 750GB (5400-rpm) hard drive
- 128GB, 256GB, or 512GB solid-state drive
- Up to 8GB of 1333MHz DDR3 SDRAM
- Apple Remote
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

# 645\_MacBook Pro (13-inch, Late 2011) - Technical Specifications.pdf

- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan

## Accessories

- Apple Thunderbolt Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Magic Mouse
- Apple Keyboard with Numeric Keypad
- Apple Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.
  5. Memory available to OS X may vary depending on graphics needs. Minimum graphics memory usage is 384MB.
  6. 1GB=1 billion bytes; actual formatted capacity less.
  7. Wireless web testing conducted by Apple in October 2011 using preproduction 2.8GHz dual-core Intel Core i7-based 13-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

Published Date: Jun 22, 2017

# MacBook Pro (17-inch, Late 2011) - Technical Specifications

## Size and weight

- Height: 0.98 inch (2.50 cm)
- Width: 15.47 inches (39.3 cm)
- Depth: 10.51 inches (26.7 cm)
- Weight: 6.6 pounds (2.99 kg)<sup>1</sup>

## Connections and expansion



- MagSafe power port
- Gigabit Ethernet port
- FireWire 800 port (up to 800 Mbps)
- Three USB 2.0 ports (up to 480 Mbps)
- Thunderbolt port (up to 10 Gbps)
- Audio line in
- Audio line out
- ExpressCard/34 slot
- Kensington lock slot

## Communications

- Wi-Fi wireless networking<sup>2</sup> (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Stereo speakers with subwoofers
- Omnidirectional microphone (located under left speaker grille)
- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- Support for Apple iPhone headset with microphone

## Environmental Status Report

MacBook Pro is designed with the following features to reduce its environmental impact:

- Highly recyclable aluminum and glass enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Energy Efficient Ethernet
- Reduced packaging volume
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>4</sup>

## Display

- 17-inch (diagonal) high-resolution LED-backlit glossy or optional antiglare widescreen display with support for millions of colors
- **Supported resolutions:** 1920 by 1200 (native), 1680 by 1050, 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio; 1280 by 1024 pixels at 5:4 aspect ratio stretched; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1600 by 1200, 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Graphics and video support

- AMD Radeon HD 6770M graphics processor with 1GB of GDDR5 memory
- Intel HD Graphics 3000 with 384MB of DDR3 SDRAM shared with main memory<sup>5</sup>
- Automatic graphics switching

# 646\_MacBook Pro (17-inch, Late 2011) - Technical Specifications.pdf

- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- FaceTime HD camera
- Thunderbolt port

## Thunderbolt digital video output

- Native Mini DisplayPort output
- DVI output using Mini DisplayPort to DVI Adapter (optional)
- VGA output using Mini DisplayPort to VGA Adapter (optional)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter supports 30-inch Apple Cinema HD Display (optional)
- HDMI audio and video output using a third-party Mini DisplayPort to [HDMI Adapter](#)

## Input

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Processor and memory

- 2.4GHz quad-core Intel Core i7 processor with 6MB shared L3 cache; or optional 2.5GHz quad-core Intel Core i7 processor with 8MB shared L3 cache
- 4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 memory; two SO-DIMM slots support up to 8GB

## Storage

- 750GB 5400-rpm Serial ATA hard drive; optional 750GB 7200-rpm hard drive or 128GB, 256GB, or 512GB solid-state drive<sup>6</sup>
- 8x slot-loading SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Maximum write: 8x DVD-R, DVD+R; 4x DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD-R; 10x CD-RW
- Maximum read: 8x DVD-R, DVD+R, DVD-ROM; 6x DVD-ROM (double layer DVD-9), DVD-R DL (double layer), DVD+R DL (double layer), DVD-RW, DVD+RW; 24x CD

## Battery and power<sup>7</sup>

- up to **7 hrs** wireless web
- Built-in 95-watt-hour lithium-polymer battery
- 85W MagSafe Power Adapter with cable management system
- MagSafe power port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB	Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)
Idle	2.8	15
Hard drive accessing	2.9	16
CD drive accessing	3.4	25

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

# 646\_MacBook Pro (17-inch, Late 2011) - Technical Specifications.pdf

## What's in the box

- MacBook Pro
- Display cleaning cloth
- 85W MagSafe Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

## Software

- OS X Lion (includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more)
- iLife (includes iPhoto, iMovie, and GarageBand)

## 17-inch Configuration

	2.4GHz MacBook Pro (MD311LL/A)
Enclosure	Precision aluminum unibody
Processor	2.4GHz quad-core Intel Core i7
L3 cache	6MB shared
Memory	4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 SDRAM; supports up to 8GB
Hard drive <sup>6</sup>	750GB Serial ATA; 5400 rpm
Slot-loading optical drive	8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
Graphics	Intel HD Graphics 3000 <sup>5</sup> and AMD Radeon HD 6770M with automatic graphics switching
Graphics memory	1GB GDDR5
Video	FaceTime HD camera; Thunderbolt port with support for DVI, VGA, dual-link DVI, and HDMI (requires adapters, sold separately)
Display	17-inch (diagonal) high-resolution LED-backlit glossy or optional antiglare widescreen display, 1920-by-1200 resolution
Expansion	One Thunderbolt port (up to 10 Gbps), one FireWire 800 port (up to 800 Mbps), three USB 2.0 ports (up to 480 Mbps), ExpressCard/34 slot
Audio	Stereo speakers with subwoofers, omnidirectional microphone, audio line in minijack (digital/analog), audio line out/headphone minijack (digital/analog)
Networking	10/100/1000BASE-T (Gigabit) Ethernet
Wireless	Wi-Fi (based on IEEE 802.11n specification) <sup>2</sup> ; Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
Hardware accessories	85W MagSafe Power Adapter, AC wall plug, power cord
Limited warranty and service	Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.
Apple and the global environment	<a href="#">Learn more</a> about Apple's dedication to reducing the environmental impact of our products and processes. <a href="#">Apple Product Environmental Reports</a> detail the environmental attributes of our products.
Recycling	Apple takes a holistic view of materials management and waste minimization. <a href="#">Learn more</a> about how to recycle your Mac.

## Options

### [Time Capsule](#)

Time Capsule is a full-featured AirPort Extreme base station with a built-in hard drive. Back up wirelessly and create a Wi-Fi network with one device.

- 2TB or 3TB server-grade hard drive
- Wi-Fi Certified for 802.11n 2.0
- USB port for connecting a USB printer or USB external hard drive

## Configure to order

- 2.5GHz quad-core Intel Core i7 processor
- 750GB (7200-rpm) hard drive

# 646\_MacBook Pro (17-inch, Late 2011) - Technical Specifications.pdf

- 128GB, 256GB, or 512GB solid-state drive
- Up to 8GB of 1333MHz DDR3 SDRAM
- Antiglare display
- Apple Remote
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- MagSafe Airline Adapter
- AppleCare Protection Plan

## Accessories

- Apple Thunderbolt Display
- AirPort Extreme Base Station
- AirPort Express Base Station
- Apple Wireless Keyboard
- Magic Mouse
- Apple Keyboard with Numeric Keypad
- Apple Mouse

- 
1. Actual weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.
  5. Memory available to OS X may vary depending on graphics needs. Minimum graphics memory usage is 384MB.
  6. 1GB=1 billion bytes; actual formatted capacity less.
  7. Wireless web testing conducted by Apple in October 2011 using preproduction 2.4GHz quad-core Intel Core i7–based 17-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

Published Date: Jun 2, 2017



# iPad (3rd generation) - Technical Specifications

## Models

- Wi-Fi
- Wi-Fi + Cellular

## Size and Weight<sup>1</sup>

### Wi-Fi

- Height: 9.50 inches (241.2 mm)
- Width: 7.31 inches (185.7 mm)
- Depth: 0.37 inch (9.4 mm)
- Weight: 1.44 pounds (652 g)

### Wi-Fi + Cellular

- Height: 9.50 inches (241.2 mm)
- Width: 7.31 inches (185.7 mm)
- Depth: 0.37 inch (9.4 mm)
- Weight: 1.46 pounds (662 g)

## Storage<sup>2</sup>

- 16GB
- 32GB
- 64GB

## Display

- Retina display
- 9.7-inch (diagonal) LED-backlit glossy widescreen Multi-Touch display with IPS technology
- 2048-by-1536-pixel resolution at 264 pixels per inch (ppi)
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously

## Chip

- Dual-core Apple A5X custom-designed, high-performance, low-power system-on-a-chip with quad-core graphics

## Wireless and Cellular

### Wi-Fi

- Wi-Fi (802.11a/b/g/n)
- Bluetooth 4.0 technology

### Wi-Fi + Cellular

- Wi-Fi (802.11a/b/g/n)
- Bluetooth 4.0 technology
- Model for AT&T: 4G LTE (700, 2100 MHz)<sup>3</sup>; UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
- Model for Verizon: 4G LTE (700 MHz)<sup>3</sup>; CDMA EV-DO Rev. A (800, 1900 MHz); UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
- Data only<sup>4</sup>

## Carriers

- AT&T

# 647\_iPad (3rd generation) - Technical Specifications.pdf

- Verizon

## Cameras, Photos, and Video Recording

- 5-megapixel iSight camera
- Autofocus
- Tap to focus
- Face detection in still images
- Video recording, HD (1080p) up to 30 frames per second with audio
- Video stabilization
- FaceTime camera with VGA-quality photos and video at up to 30 frames per second
- Photo and video geotagging

## Battery and Power<sup>5</sup>

### Wi-Fi

- Built-in 42.5-watt-hour rechargeable lithium-polymer battery
- Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
- Charging via power adapter or USB to computer system

### Wi-Fi + Cellular

- Built-in 42.5-watt-hour rechargeable lithium-polymer battery
- Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
- Up to 9 hours of surfing the web using cellular data network
- Charging via power adapter or USB to computer system

## Input and Output

### Wi-Fi

- 30-pin dock connector port
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Microphone

### Wi-Fi + Cellular

- 30-pin dock connector port
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Microphone
- Micro-SIM card tray

## Sensors

- Accelerometer
- Ambient light sensor
- Gyroscope

## Location

### Wi-Fi

- Wi-Fi
- Digital compass

### Wi-Fi + Cellular

- Wi-Fi
- Digital compass
- Assisted GPS and GLONASS

# 647 iPad (3rd generation) - Technical Specifications.pdf

- Cellular

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: HE-AAC (V1 and V2), AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, and 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit
- Dolby Digital 5.1 surround sound pass-through with Apple Digital AV Adapter (sold separately)

## TV and Video

- AirPlay Mirroring to Apple TV (2nd and 3rd generation) at 720p
- AirPlay video streaming to Apple TV (3rd generation) at up to 1080p and Apple TV (2nd generation) at up to 720p
- Video mirroring and video out support: Up to 1080p with Apple Digital AV Adapter or Apple VGA Adapter (adapters sold separately)
- Video out support at 576i and 480i with Apple Composite AV Cable (cable sold separately)
- Video formats supported: H.264 video up to 1080p, 30 frames per second, High Profile level 4.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

Viewable document types: .jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel)

## Languages

- Language support for English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- Keyboard support for English (U.S.), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Tibetan, Turkish, Ukrainian, Vietnamese
- Dictionary support (enables predictive text and autocorrect) for English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, French (Canadian), French (Switzerland), German, Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Indonesian, Latvian, Lithuanian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- Dictation support for English (U.S., UK, and Australian), French, German, Japanese

## Accessibility

- VoiceOver screen reader
- Support for playback of closed-captioned content
- AssistiveTouch interface for adaptive accessories
- Full-screen zoom magnification
- Large fonts
- White on black display
- Left/right volume adjustment

## Environmental Requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## System Requirements

# 647 iPad (3rd generation) - Technical Specifications.pdf

- Apple ID (required for some features)
- Internet access<sup>6</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X v10.5.8 or later
  - PC: Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
  - iTunes 10.6 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## In the Box

- iPad
- Dock Connector to USB Cable
- 10W USB Power Adapter
- Documentation

## Built-in Apps

- Safari
- Photos
- App Store
- Maps
- Photo Booth
- Reminders
- Camera
- Mail
- FaceTime
- iTunes
- Music
- YouTube
- Calendar
- Messages
- Newsstand
- Videos
- Game Center
- Contacts
- Notes

## iPad and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iPad embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:**

- Mercury-free LCD display
- Arsenic-free display glass
- BFR-free
- PVC-free
- Recyclable aluminum and glass enclosure

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your iPad.](#)

- 
1. Actual size and weight vary by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. 4G LTE is supported only on AT&T and Verizon networks in the U.S. and on Bell, Rogers, and Telus networks in Canada. See your carrier for details.
  4. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
  5. Testing conducted by Apple in February 2012 using preproduction iPad units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video

## 647\_iPad (3rd generation) - Technical Specifications.pdf

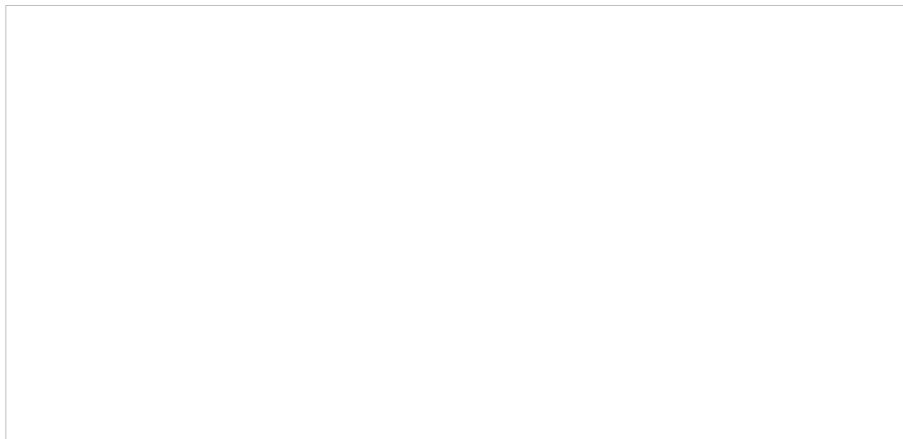
content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique songs, consisting of a combination of songs imported from CDs using iTunes (128-Kbps AAC encoding) and songs purchased from the iTunes Store (256-Kbps AAC encoding). Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.

6. Wireless broadband recommended; fees may apply.

Published Date: Jun 20, 2013

# Apple TV (3rd generation) - Technical Specifications

## Size and Weight



- **Height:** 0.9 inch (23 mm)
- **Width:** 3.9 inches (98 mm)
- **Depth:** 3.9 inches (98 mm)
- **Weight:** 0.6 pound<sup>1</sup>

## In the Box

- Apple TV
- Apple Remote
- Power cord
- Documentation

## Processor

- Apple single-core A5 chip

## System Requirements

- Wi-Fi (802.11a, b, g, or n) wireless network (wireless video streaming requires 802.11a, g, or n) or 10/100BASE-T Ethernet network
- iTunes Store account for buying or renting movies and buying TV shows
- Netflix account for streaming Netflix content
- For streaming media from a Mac or PC: iTunes 10.6 or later; iTunes Store account for Home Sharing
- MLB.TV subscription required to watch live and archived games
- NBA.com League Pass Broadband subscription required to watch live and archived games
- NHL GameCenter Live subscription required to watch live and archived games

## Ports and Interfaces

- HDMI<sup>2</sup>
- Optical audio
- 10/100BASE-T Ethernet
- Built-in IR receiver
- Micro-USB (for service and support)

## Wireless

- Wi-Fi (802.11a/b/g/n)
- Bluetooth support for Apple Wireless Keyboard (requires Apple TV software version 5.2 or later)

## Environmental Requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Power

# 648\_Apple TV (3rd generation) - Technical Specifications.pdf

- Built-in 6-watt universal power supply

## Video Formats

- H.264 video up to 1080p, 30 frames per second, High or Main Profile level 4.0 or lower, Baseline profile level 3.0 or lower with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Audio Formats

- HE-AAC (V1), AAC (16 to 320 Kbps), protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Apple Lossless, AIFF, and WAV; Dolby Digital 5.1 surround sound pass-through

## Photo Formats

- JPEG, GIF, TIFF

## TV Compatibility

- Compatible with high-definition TVs with HDMI and capable of 1080p or 720p at 60/50Hz,<sup>2</sup> including popular models from these manufacturers: Hitachi, JVC, LG, Mitsubishi, NEC, Panasonic, Philips, Pioneer, Samsung, Sharp, Sony, Toshiba, Vizio, Westinghouse

## Apple TV and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

### Apple TV is designed with the following features to reduce its environmental impact:

- Brominated flame retardant-free
- PVC-free
- Meets ENERGY STAR 3.0 requirements for set-top boxes

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Apple products.

## iTunes Movies and TV Shows<sup>3</sup>

	Resolution	Audio
<b>HD Movie</b>	1920 x 1080 (maximum)	Dolby Digital 5.1 surround sound (not all titles)
<b>SD Movie</b>	720 x 480 anamorphic (maximum)	Dolby Digital 5.1 surround sound (not all titles)
<b>HD TV Show</b>	1920 x 1080 (maximum)	Dolby Digital 5.1 surround sound (not all titles)
<b>SD TV Show</b>	720 x 480 anamorphic (maximum)	Dolby Digital 5.1 surround sound (not all titles)

## Accessories

- **Apple HDMI to HDMI Cable**  
The Apple HDMI to HDMI Cable lets you connect an Apple TV, Mac mini, or other HDMI device to an HDTV or A/V receiver. Both high-definition digital video and multichannel digital audio are delivered over this single cable for stunning picture and sound.
- **Belkin 6' Digital Toslink Optical Audio Cable with Line-Out Adapter**  
Belkin 6' Digital Toslink Optical Audio Cable with Line-Out Adapter sends uncorrupted audio to any A/V receiver or device. It's ideal for audiophiles who want to take full advantage of the digital output capability built into their Mac, A/V receiver, DVD player, satellite dish receiver, or cable box.
- **AppleCare Protection Plan**  
The AppleCare Protection Plan provides service and support from the people who know your Apple TV best. For up to two years from the original purchase date of your Apple TV, you get direct, one-stop access to Apple's award-winning telephone technical support and

# 648\_Apple TV (3rd generation) - Technical Specifications.pdf

repair coverage.

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1. Weight varies by configuration and manufacturing process.
2. Requires HDCP when playing protected content.
3. A sustained 8-Mbit/s or faster Internet connection is recommended for viewing 1080p high-definition movies and TV shows, 6-Mbit/s or faster for viewing 720p content, and 2.5-Mbit/s or faster for standard-definition content. Internet connection speeds may vary depending on your ISP and other factors.

Services are not available in all countries and are subject to change.

Published Date: Feb 24, 2017



# MacBook Pro (13-inch, Mid 2012) - Technical Specifications

## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions: 1280 by 800 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched

## Processor

- 2.5GHz dual-core Intel Core i5 processor (Turbo Boost up to 3.1GHz) with 3MB L3 cache
- 2.9GHz dual-core Intel Core i7 processor (Turbo Boost up to 3.6GHz) with 4MB L3 cache

## Memory

- **2.5GHz**  
4GB of 1600MHz DDR3 memory  
*Configurable to 8GB*
- **2.9GHz**  
8GB of 1600MHz DDR3 memory

## Storage<sup>1</sup>

- **2.5GHz**  
500GB 5400-rpm hard drive  
*Configurable options:*
  - 750GB 5400-rpm hard drive
  - 128GB solid-state drive
  - 256GB solid-state drive
  - 512GB solid-state drive
- **2.9GHz**  
750GB 5400-rpm hard drive  
*Configurable options:*
  - 1TB 5400-rpm hard drive
  - 128GB solid-state drive
  - 256GB solid-state drive
  - 512GB solid-state drive

## Size and Weight

- Height: 0.95 inch (2.41 cm)
- Width: 12.78 inches (32.5 cm)
- Depth: 8.94 inches (22.7 cm)
- Weight: 4.5 pounds (2.06 kg)<sup>2</sup>

## Graphics and Video Support

- Intel HD Graphics 4000
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors

## Thunderbolt digital video output

- Native Mini DisplayPort output
- DVI output using Mini DisplayPort to DVI Adapter (sold separately)
- VGA output using Mini DisplayPort to VGA Adapter (sold separately)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

## Camera

- 720p FaceTime HD camera

## Connections and Expansion

- MagSafe power port

# 649\_MacBook Pro (13-inch, Mid 2012) - Technical Specifications.pdf

- Gigabit Ethernet port
- FireWire 800 port (up to 800 Mbps)
- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt port (up to 10 Gbps)
- Headphone port
- SDXC card slot
- Kensington lock slot
- 8x SuperDrive

## Wireless

- 802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible
- Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers with subwoofer
- Omnidirectional microphone
- Headphone port
  - Support for Apple iPhone headset with remote and microphone
  - Support for audio line out (digital/analog)

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 7 hours wireless web
- Built-in 63.5-watt-hour lithium-polymer battery
- 60W MagSafe Power Adapter with cable management system; MagSafe power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 113° F (–24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Included Software OS X Lion

Includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more.

**OS X Mountain Lion. Coming soon.** Buy a new Mac now and get a free upgrade to the next release of OS X when it arrives this summer. [Learn more.](#)

## iLife

Includes iPhoto, iMovie, and GarageBand. [Learn more about iLife.](#)

## Limited Warranty and Service

Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer’s purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Pro

# 649\_MacBook Pro (13-inch, Mid 2012) - Technical Specifications.pdf

- Display cleaning cloth
- 13-inch: 60W MagSafe Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

## Configure to Order

Configure your MacBook Pro to order with these options, only at the [Apple Online Store](#):

- 8GB memory upgrade (two 4GB)
- 750GB 5400-rpm hard drive
- 1TB 5400-rpm hard drive
- 128GB, 256GB, or 512GB solid-state drive

## MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more.](#)

**MacBook Pro is designed with the following features to reduce environmental impact:**

- Highly recyclable aluminum enclosure
- Mercury-free LED backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Reduced packaging volume
- Meets ENERGY STAR Version 5.2 requirements

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. The [Apple Product Environmental Specification](#) details the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	13" 2.9 GHz	13" 2.5 GHz	13" 2.9 GHz	13" 2.5 GHz
Idle	2.7	2.7	16	16
Hard drive accessing	2.8	2.8	17	17
CD drive accessing	N/A	3.2	N/A	28

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Pro
- Final Cut Pro X

### Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA

# 649\_MacBook Pro (13-inch, Mid 2012) - Technical Specifications.pdf

- Adapter Apple Mini DisplayPort to Dual-Link DVI Adapter

## AirPort and Wireless

- AirPort Extreme Base Station
- AirPort Express Base Station
- Time Capsule
- Apple Remote
- Apple Wireless Keyboard
- Apple Magic Mouse
- Apple Magic Trackpad

## Other Accessories

- 60W MagSafe Power Adapter (13-inch)
- AppleCare Protection Plan

- 
1. 1GB=1 billion bytes; actual formatted capacity less.
  2. Actual weight varies by configuration and manufacturing process.
  3. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  4. Wireless web testing conducted by Apple in May 2012 using preproduction 2.6GHz quad-core Intel Core i7–based 15-inch MacBook Pro units and preproduction 2.9GHz dual-core Intel Core i7–based 13-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.

Published Date: Feb 10, 2014

# iMac (Summer 2000) - Technical Specifications

This article has been archived and is no longer updated by Apple.

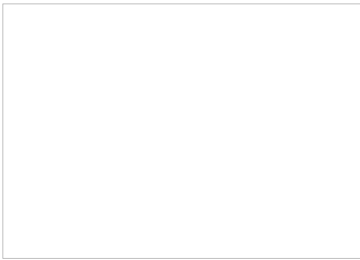
## iMac (Summer 2000) - Technical Specifications

### iMac (Summer 2000)

Logic Board	Ports	Power
Processor: G3, 350, 400, 450, 500	USB: 2 yes	Max Watts: 150
PMMU: integrated	ADB: n/a	Amps: 1.7
FPU: integrated	Video: DB-15 VGA	BTU per Hr: 513
Data Path: 64-bit, 100 MHz	Floppy: none	Voltage: 100-260
L1 Cache:	SCSI: none	Freq Range: 47-63 Hz
L2 Cache: 512K	Geoports: none	Battery Type: 3.6V Lithium
2nd Processor: none	Ethernet: 10/100Base-T	
Slots: 0	FireWire: 2 (DV, Special Edition)	
	Mic Type: Built-in	
	AirPort Ready: Yes	
	Other Ports: Speaker, Headphone,	
Memory	Video Memory	
Logic Board: none	Video Memory	
RAM Slots: 2, PC100 DIMM	Resolution 8 MB (SDRAM)	
Min - Max RAM: 64 MB - 1 GB	512 x 384 n/a	
Min RAM Speed: 100 MHz	640 x 400 n/a	
RAM Sizes: 32, 64, 128, 256, 512 MB	640 x 480 32-bit	
Install in Groups of: 1	800 x 600 32-bit	
	832 x 624 n/a	
	1024 x 768 32-bit	
	1152 x 870 n/a	
	1280 x 1024 n/a	
	Notes: VGA port for video mirroring on all DV models	
Physical	Software	Storage
Introduced: 7/19/2000	Addressing Modes: 32-bit	Floppy Size: n/a
Discontinued: 2/22/2001	Orig SSW: 9.0.4	Floppy Inject: n/a
Form Factor: iMac	Orig Enabler: n/a	Min. Int HD Size: 7, 10, 20, 30 GB
Gestalt ID:	ROM ID: n/a	Int HD Interface: ATA
Weight (lbs): 34.7	ROM Ver: n/a	Orig CD Speed 24x
Dimensions (in): 15 H x 15 W x 17.1 D	ROM Size: 1 MB	Int CD Support: yes
	AppleTalk Ver: n/a	
	Mac OS Supported: 9 X	

Published Date: Apr 6, 2016

# MacBook Air (11-inch, Mid 2012) - Technical Specifications



## Display

- 11.6-inch (diagonal) high-resolution LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions:  
1366 x 768 (native) at 16:9 ratio, 1152 x 720 pixels and 1024 x 640 at 16:10 ratio, and 1024 x 768 and 800 x 600 at 4:3 ratio.

## Storage<sup>1</sup>

- 64GB flash storage
- 128GB flash storage  
*Configurable to 256GB or 512GB flash storage.*

## Processor

1.7GHz dual-core Intel Core i5 (Turbo Boost up to 2.6GHz) with 3MB shared L3 cache  
*Configurable to dual-core 2.0GHz Intel Core i7 (Turbo Boost up to 3.2GHz) with 4MB shared L3 cache.*

## Memory

4GB of 1600MHz DDR3L onboard memory  
*Configurable to 8GB.*

## Size and Weight

- *Height:* 0.11-0.68 inch (0.3-1.7 cm)
- *Width:* 11.8 inches (30 cm)
- *Depth:* 7.56 inches (19.2 cm)
- *Weight:* 2.38 pounds (1.08 kg)<sup>2</sup>

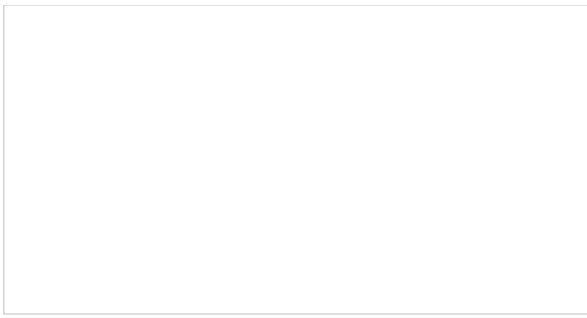
## Graphics and Video Support

- Intel HD Graphics 4000
- Dual display and video mirroring:  
Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- **Thunderbolt digital video output**
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
  - HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

## Camera

720p FaceTime HD camera

## Connections and Expansion



- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt port (up to 10 Gbps)
- MagSafe 2 power port

## Wireless

- 802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible
- Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Omnidirectional microphone
- Headphone port
- Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 5 hours wireless web
- Up to 30 days standby time
- Built-in 35-watt-hour lithium-polymer battery
- 45W MagSafe 2 Power Adapter with cable management; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Included Software

- **OS X Mountain Lion**  
Includes Mail, Messages, Contacts, Calendar, Safari, Reminders, Notification Center, Notes, Dictation, iCloud, Time Machine, FaceTime, Photo Booth, AirPlay, Game Center, the Mac App Store, iTunes, Gatekeeper, Twitter and Facebook integration,<sup>5</sup> and more. [Learn more about OS X Mountain Lion](#)
- **iLife**  
Includes iPhoto, iMovie, and GarageBand. [Learn more about iLife](#)

## Limited Warranty and Service

Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer’s purchase date. Only the AppleCare Protection Plan provides you with direct

# 650\_MacBook Air (11-inch, Mid 2012) - Technical Specifications.pdf

telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Air
- 45W MagSafe 2 Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

## Configure to Order

Configure your MacBook Air to order with these options, only at the Apple Online Store:

- 2.0GHz dual-core Intel Core i7 (Turbo Boost up to 3.2GHz)
- 8GB memory upgrade
- 256GB or 512GB of flash storage

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact.

**MacBook Air is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>6</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac.](#)

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd} (B)$ 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm} (dB)$
Idle	2.5	7
Hard drive accessing	N/A	N/A
CD drive accessing	N/A	N/A

## Available Accessories

- **Mac Software**
  - iWork
  - Aperture
  - Logic Pro
  - Final Cut Pro X
- **Displays and Adapters**
  - Apple Thunderbolt Display
  - Apple Mini DisplayPort to DVI Adapter
  - Apple Mini DisplayPort to VGA Adapter
  - Apple Mini DisplayPort to Dual-Link DVI Adapter
  - MagSafe to MagSafe 2 Converter
- **AirPort and Wireless**
  - AirPort Extreme Base Station
  - AirPort Express Base Station



## 650\_MacBook Air (11-inch, Mid 2012) - Technical Specifications.pdf

- Time Capsule
  - Apple Wireless Keyboard
  - Apple Magic Mouse
  - Apple Magic Trackpad
  - **Other Accessories**
    - Apple USB SuperDrive
    - Thunderbolt to Gigabit Ethernet Adapter
    - Thunderbolt to FireWire Adapter
    - AppleCare Protection Plan
    - Apple USB Ethernet Adapter
- 

1. 1GB=1 billion bytes; actual formatted capacity less.
2. Actual weight varies by configuration and manufacturing process.
3. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
4. Testing conducted by Apple in May 2012 using preproduction 1.8GHz dual-core Intel Core i5–based 13-inch MacBook Air units and preproduction 1.7GHz dual-core Intel Core i5–based 11-inch MacBook Air units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. The standby test measures battery life by allowing a system, connected to a wireless network, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
5. Facebook integration coming this fall.
6. PVC-free AC power cord available in all regions except China and South Korea.
7. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Jul 29, 2016

# AirPort Express 802.11n (2nd Generation) - Technical Specifications

AirPort Express 802.11n (2nd Generation)

## Size and Weight

- Dimensions: 3.85 inches (98 mm) by 3.85 inches (98 mm) by 0.9 inch (23 mm)
- Weight: 8.5 ounces (240 grams)<sup>1</sup>

## Wireless

- IEEE 802.11a/b/g/n
- Simultaneous dual-band 2.4GHz and 5GHz
- Radio output power: 20.5 dBm maximum (varies by country)
- Channels 1-11, 36-116, and 132-165 approved for use in the United States and Canada
- Channels 1-13, 36-64, and 100-140 approved for use in Europe and Japan
- Channels 1-13, 36-64, and 149-165 approved for use in Australia, Hong Kong, and New Zealand

## Compatibility

- Interoperable with 802.11a, 802.11b, 802.11g, and 802.11n-enabled Mac computers, iOS devices, Apple TV, Windows-based PCs, and other Wi-Fi devices
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP, IPv6 (6to4 and manual tunnels)

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>2</sup>
- WPA/WPA2 Enterprise<sup>2</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Software and Documentation

- Printed documentation included
- [AirPort Utility for Mac available for free download](#)
- [AirPort Utility for iOS available for free download](#)
- [Bonjour for Windows available for free download](#)

## Interfaces

- Simultaneous dual-band 802.11n wireless
- 10/100BASE-T Ethernet WAN port for connecting a DSL modem, cable modem, or Ethernet network
- 10/100BASE-T Ethernet LAN port for connecting a computer, Ethernet hub, or networked printer
- USB 2 port for connecting a USB printer
- 3.5-mm audio minijack for analog or optical digital sound<sup>3</sup>

## Number of Users

- 50

## Electrical and Environmental Requirements

- 100-240V AC, 50-60Hz; input current: 0.2 amp
- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity (operating): 20% to 90%, noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)
- Maximum storage altitude: 15,000 feet

## Agency Approval

- FCC 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268: 2003, UL 60950, CSA-C22.2 No. 60950

## System Requirements

- **Setup and Administration**
  - iPhone, iPad, or iPod touch with iOS 6 or later and AirPort Utility
  - Mac with OS X Lion v10.7.3 or later and [AirPort Utility 6.1](#)
  - Mac with OS X v10.5.7 or later and [AirPort Utility 5.6.1](#)
  - PC with Windows 7 or later and [AirPort Utility 5.6.1](#)
- **Wireless Device Access**
  - Any Wi-Fi-enabled device that uses the 802.11a/b/g/n specification
- **Shared Printing with a USB Printer**
  - USB printer
  - Mac with OS X v10.2.7 or later
  - PC with Windows XP (SP3), Windows Vista (SP2), Windows 7 (SP1), or Windows 8

## AirPort Express and the Environment

Apple takes a complete product life-cycle approach to determining our environmental impact. [Learn more](#)

AirPort Express is designed with the following features to reduce its environmental impact:

- Brominated flame retardant-free
- PVC-free<sup>4</sup>
- Meets ENERGY STAR 1.0 requirements for Small network equipment

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. The Apple [Product Environmental Specification](#) details the environmental attributes of our products.

## Recycling

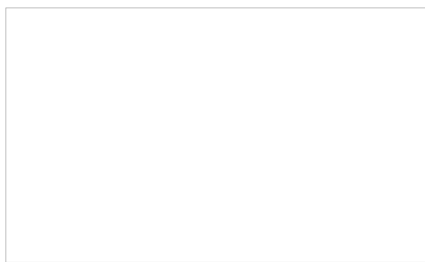
Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

- 
1. Weight varies by configuration and manufacturing process.
  2. Support for WPA requires OS X v10.3 or later. Use of Wi-Fi Protected Access (WPA) reduces the maximum number of network users. When joining an existing wireless network, AirPort Express supports only WPA-Personal. WPA2 requires a Mac computer with an AirPort Extreme Card and OS X v10.3 or later.
  3. Requires a compatible stereo system or powered speakers. AirPlay is available on all devices running iOS 4.3 or later. Some features require the latest software. Second-generation Apple TV or later required.
  4. PVC-free AC power cord available in all regions except India and South Korea.

Wireless Internet access requires a wireless-enabled computer or device, a base station or other access point, and Internet access (fees may apply).

Published Date: May 10, 2017

# Mac Pro (Mid 2012) - Technical Specifications



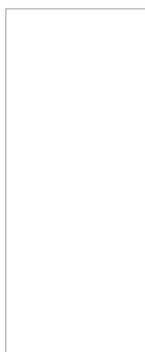
## Size and weight

- Height: **20.1** inches (51.1 cm)
- Width: **8.1** inches (20.6 cm)
- Depth: **18.7** inches (47.5 cm)
- Weight:
  - 12-core **41.2** pounds (18.7 kg)<sup>1</sup>
  - Quad-core **39.9** pounds (18.1 kg)<sup>1</sup>

## Processing

- **12-core (standard configuration)**
  - Two 2.4GHz 6-Core Intel Xeon E5645 processors
  - 12MB of fully shared L3 cache per processor
  - Turbo Boost dynamic performance up to 2.67GHz
  - Hyper-Threading technology for up to 24 virtual cores
- **Quad-core (standard configuration)**
  - One 3.2GHz Quad-Core Intel Xeon W3565 processor
  - 8MB of fully shared L3 cache per processor
  - Turbo Boost dynamic performance up to 3.46GHz
  - Hyper-Threading technology for up to 8 virtual cores
- **Advanced Intel microarchitecture**
  - Integrated memory controller
  - 128-bit SSE4 SIMD engine
  - 64-bit data paths and registers
  - Optimized for energy efficiency

Configure your Mac Pro now, only at the [Apple Online Store](#).



## Connections and audio

- Four FireWire 800 ports (two on front panel, two on back panel)
- Five USB 2.0 ports (two on front panel, three on back panel)
- Two USB 2.0 ports on included keyboard
- Front-panel headphone minijack and internal speaker
- Optical digital audio input and output TOSLINK ports
- Analog stereo line-level input and output minijacks
- Multichannel audio through Mini DisplayPort

## Graphics and displays

# 652\_Mac Pro (Mid 2012) - Technical Specifications.pdf

- Double-wide, 16-lane PCI Express 2.0 graphics slot with one of the following graphics cards installed:
  - ATI Radeon HD 5770 with 1GB of GDDR5 memory, PCI Express 2.0, two Mini DisplayPort outputs, and one dual-link DVI port
  - ATI Radeon HD 5870 with 1GB of GDDR5 memory, PCI Express 2.0, two Mini DisplayPort outputs, and one dual-link DVI port
- Option to install two ATI Radeon HD 5770 cards
- Support for up to six displays<sup>2</sup>
- Support for digital resolutions up to 2560 by 1600 pixels
- Support for analog resolutions up to 2048 by 1536 pixels
- Video adapters available for:
  - Additional DVI output using Mini DisplayPort to DVI Adapter (optional)
  - Additional dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (optional)
  - VGA output using Mini DisplayPort to VGA Adapter or DVI to VGA Display Adapter (optional)

## Memory

- **Dual-processor systems**
  - 2.4GHz, 2.66GHz, and 3.06GHz systems: 1333MHz DDR3 ECC SDRAM
  - Eight memory slots (four per processor) supporting up to 64GB of main memory using 1GB, 2GB, 4GB, or 8GB DIMMs
- **Single-processor systems**
  - 3.2GHz system: 1066MHz DDR3 ECC SDRAM
  - 3.33GHz system: 1333MHz DDR3 ECC SDRAM
  - Four memory slots supporting up to 32GB of main memory using 1GB, 2GB, 4GB, or 8GB DIMMs

## Communications

- Built-in AirPort Extreme 802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + Enhanced Data Rate (EDR) wireless technology
- Two independent 10/100/1000BASE-T Ethernet (RJ-45) interfaces with support for jumbo frames

## Environmental Status Report

- BFR-free
- PVC-free (internal cables)
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements<sup>4</sup>
- Rated EPEAT Gold<sup>5</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level, Operator Position L <sub>pAm</sub> (dB)	
	2.4 GHz	3.2 GHz	2.4 GHz	3.2 GHz
Idle	3.5	3.7	25	26
Hard drive accessing	3.5	3.7	25	26
CD drive accessing	5.1	4.7	42	42

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Electrical and operating requirements

- Line voltage: 100-120V AC or 200-240V AC (wide-range power supply input voltage)
- Frequency: 50Hz to 60Hz single phase
- Current: Maximum of 12A (low-voltage range) or 5A (high-voltage range)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet

## PCI Express expansion

# 652\_Mac Pro (Mid 2012) - Technical Specifications.pdf

- Three open full-length PCI Express expansion slots<sup>6</sup>
  - One PCI Express 2.0 x16 slot
  - Two PCI Express 2.0 x4 slots
- All slots provide mechanical support for 16-lane cards
- 300W combined maximum for all PCI Express slots

## Storage

- Four 3.5-inch cable-free, direct-attach drive bays with built-in independent 3Gb/s Serial ATA channels; four internal drive carriers included



- Up to 8TB of internal storage<sup>7</sup> in bays 1 through 4 using hard drives or solid-state drives in the following capacities:
  - 1TB or 2TB hard drives, Serial ATA 3Gb/s, 7200 rpm, 32MB cache
  - 512GB solid-state drive, Serial ATA 3Gb/s
- 18x SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)
  - Writes DVD+R and DVD-R discs at up to 18x speed
  - Writes DVD+R DL and DVD-R DL discs at up to 8x speed
  - Writes DVD+RW discs at up to 8x speed
  - Writes DVD-RW discs at up to 6x speed
  - Reads DVDs at up to 18x speed
  - Writes CD-R and CD-RW discs at up to 32x speed
  - Reads CDs at up to 32x speed
- One open optical drive bay for optional second SuperDrive

## What's included

### In the box

- **Quad-core and 12-core:**
  - Mac Pro
  - Power cord
  - Apple Keyboard with Numeric Keypad
  - Magic Mouse
  - USB keyboard extension cable
  - Printed and electronic documentation
- **Server:**
  - Mac Pro
  - Power cord
  - Printed and electronic documentation

## Included software

- **Quad-core and 12-core:**
  - OS X Mountain Lion  
Includes Mail, Messages, Contacts, Calendar, Safari, Reminders, Notification Center, Notes, Dictation, iCloud, Time Machine, FaceTime, Photo Booth, Game Center, the Mac App Store, iTunes, Gatekeeper, Twitter and Facebook integration<sup>8</sup> and more.
- **Server:**
  - OS X Server  
Includes Server App, Profile Manager, Wiki Server, Calendar Server, Mail Server, Xsan, the Mac App Store, Safari, Time Machine, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more.
- **Quad-core, 12-core, and Server:**
  - iLife  
Includes iPhoto, iMovie, and GarageBand. [Learn more about iLife](#)

## Accessories

- **Upgrades**

- 1GB Memory Kit
- 2GB Memory Kit
- 4GB Memory Kit
- 1TB SATA Drive Kit
- 2TB SATA Drive Kit
- 512GB Solid-State Drive Kit
- ATI Radeon HD 5770 Graphics Upgrade Kit
- Apple Dual-Channel 4Gb Fibre Channel PCI Express Card
- Apple Quad-Channel 4Gb Fibre Channel PCI Express Card
- **Software**
  - Final Cut Pro
  - Aperture
  - Logic Pro
  - Apple Remote Desktop
  - iWork
  - FileMaker
- **Display and Graphics**
  - Apple LED Cinema Display
  - VESA Mount Adapter Kit
  - Apple Mini DisplayPort to DVI Adapter
  - Apple Mini DisplayPort to VGA Adapter
  - Apple Mini DisplayPort to Dual-Link DVI Adapter
- **AirPort and Wireless**
  - Time Capsule
  - AirPort Express Base Station
  - AirPort Extreme Base Station
  - Apple Wireless Keyboard
  - Magic Trackpad

## Configuration Options

	Quad-Core (MD770LL/A)	12-Core (MD771LL/A)	Quad-Core Server (MD772LL/A)
Processor	3.2GHz Quad-Core Intel Xeon	Two 2.4GHz 6-Core Intel Xeon	3.2GHz Quad-Core Intel Xeon
Cache	8MB fully shared L3 cache	12MB fully shared L3 cache per processor	8MB fully shared L3 cache
Memory	6GB (three 2GB DIMMs) of 1066MHz DDR3 ECC SDRAM	12GB (six 2GB DIMMs) of 1333MHz DDR3 ECC SDRAM	8GB (four 2GB DIMMs) of 1066MHz DDR3 ECC SDRAM
PCI Express 2.0 graphics	ATI Radeon HD 5770 with 1GB GDDR5 memory, two Mini DisplayPort outputs, and one dual-link DVI video output		
Hard disk drive	1TB Serial ATA (3Gb/s); 7200 rpm		Two 1TB Serial ATA (3Gb/s); 7200 rpm
Optical drive	18x SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)		
Wireless	Built-in AirPort Extreme 802.11n Wi-Fi <sup>3</sup> and Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology		
PCI Express	Three open full-length PCI Express 2.0 expansion slots with mechanical support for 16-lane cards; 300W combined maximum for all PCI Express slots		
Included Software	OS X and iLife '11		OS X Server and iLife '11

652\_Mac Pro (Mid 2012) - Technical Specifications.pdf

	Quad-Core (MD770LL/A)	12-Core (MD771LL/A)	Quad-Core Server (MD772LL/A)
Build-to-Order Options	<ul style="list-style-type: none"><li>• 6-Core: 3.33GHz Intel Xeon</li><li>• 8GB memory (four 2GB DIMMs)</li><li>• 12GB memory (three 4GB DIMMs)</li><li>• 16GB memory (four 4GB DIMMs)</li><li>• 24GB memory (three 8GB DIMMs)</li><li>• 32GB memory (four 8GB DIMMs)</li><li>• ATI Radeon HD 5870 with 1GB GDDR5</li><li>• Two ATI Radeon HD 5770</li><li>• Drive bays 1-4: 1TB or 2TB Serial ATA 3Gb/s hard drive (7200 rpm); 512GB solid-state drive<sup>6</sup></li><li>• Two 18x SuperDrive optical drives</li><li>• Apple Wireless Keyboard</li><li>• Apple Mouse</li><li>• Magic Trackpad</li><li>• Dual-Channel 4Gb Fibre Channel card</li><li>• Quad-Channel 4Gb Fibre Channel card</li></ul>	<ul style="list-style-type: none"><li>• 12-Core: Two 2.66GHz or 3.06GHz Intel Xeon</li><li>• 16GB memory (eight 2GB DIMMs)</li><li>• 24GB memory (six 4GB DIMMs)</li><li>• 32GB memory (eight 4GB DIMMs)</li><li>• 48GB memory (six 8GB DIMMs)</li><li>• 64GB memory (eight 8GB DIMMs)</li><li>• ATI Radeon HD 5870 with 1GB GDDR5</li><li>• Two ATI Radeon HD 5770</li><li>• Drive bays 1-4: 1TB or 2TB Serial ATA 3Gb/s hard drive (7200 rpm); 512GB solid-state drive<sup>6</sup></li><li>• Two 18x SuperDrive optical drives</li><li>• Apple Wireless Keyboard</li><li>• Apple Mouse</li><li>• Magic Trackpad</li><li>• Dual-Channel 4Gb Fibre Channel card</li><li>• Quad-Channel 4Gb Fibre Channel card</li></ul>	<ul style="list-style-type: none"><li>• 6-Core: 3.33GHz Intel Xeon</li><li>• 12-Core: Two 2.4GHz, 2.66GHz, or 3.06GHz Intel Xeon</li><li>• 12GB memory (three 4GB DIMMs)</li><li>• 16GB memory (four 4GB DIMMs)</li><li>• 16GB memory (eight 2GB DIMMs)</li><li>• 24GB memory (three 8GB DIMMs)</li><li>• 24GB memory (six 4GB DIMMs)</li><li>• 32GB memory (four 8GB DIMMs)</li><li>• 32GB memory (eight 4GB DIMMs)</li><li>• 64GB memory (eight 8GB DIMMs)</li><li>• Drive bays 1-4: 1TB or 2TB Serial ATA 3Gb/s hard drive (7200 rpm); 512GB solid-state drive<sup>6</sup></li><li>• Two 18x SuperDrive optical drives</li><li>• Dual-Channel 4Gb Fibre Channel card</li><li>• Quad-Channel 4Gb Fibre Channel card</li></ul>

1. Actual weight varies by configuration and manufacturing process.

2. Connecting more than three displays requires installation of two ATI Radeon HD 5770 graphics cards.

3. Wireless Internet access requires a wireless access point and Internet access; fees may apply.

4. Mac Pro systems configured with a Fibre Channel card or OS X Server do not meet ENERGY STAR requirements.

5. Mac Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

6. PCI Express slots are not compatible with PCI or PCI-X expansion cards.

7. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.

8. Facebook integration coming this fall.



# MacBook Pro (Retina, 15-inch, Mid 2012) - Technical Specifications

	15-inch MacBook Pro with Retina display: 2.3GHz	15-inch MacBook Pro with Retina display: 2.6GHz
Display	<ul style="list-style-type: none"><li>Retina display: 15.4-inch (diagonal) LED-backlit display with IPS technology; 2880-by-1800 resolution at 220 pixels per inch with support for millions of colors</li><li>Supported resolutions: 2880 by 1800 pixels (Retina); scaled resolutions: 1920 by 1200, 1680 by 1050, 1280 by 800, and 1024 by 640 pixels</li></ul>	
Processor	<ul style="list-style-type: none"><li>2.3GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.3GHz) with 6MB shared L3 cache</li></ul>	<ul style="list-style-type: none"><li>2.6GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.6GHz) with 6MB shared L3 cache</li><li>Configurable to 2.7GHz quad-core Intel Core i7 (Turbo Boost up to 3.7GHz).</li></ul>
Memory	<ul style="list-style-type: none"><li>8GB of 1600MHz DDR3L onboard memory</li><li>Configurable to 16GB.</li></ul>	
Storage <sup>1</sup>	256GB	512GB  Configurable to 768GB flash storage.
Size and Weight	Height: 0.71 inch (1.8 cm) Width: 14.13 inches (35.89 cm) Depth: 9.73 inches (24.71 cm) Weight: 4.46 pounds (2.02 kg) <sup>2</sup>	
Graphics and Video Support	<ul style="list-style-type: none"><li>Intel HD Graphics 4000</li><li>NVIDIA GeForce GT 650M with 1GB of GDDR5 memory and automatic graphics switching</li><li>Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on up to two external displays, at millions of colors</li></ul> <b>Thunderbolt digital video output</b> <ul style="list-style-type: none"><li>Native Mini DisplayPort output</li><li>DVI output using Mini DisplayPort to DVI Adapter (sold separately)</li><li>VGA output using Mini DisplayPort to VGA Adapter (sold separately)</li><li>Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)</li></ul>	
Camera	<ul style="list-style-type: none"><li>720p FaceTime HD camera</li></ul>	

Ports on the MacBook Pro with Retina display

## Connections and Expansion

- MagSafe 2 power port
- Two Thunderbolt ports (up to 10 Gbps)
- Two USB 3 ports (up to 5 Gbps)
- HDMI port
- Headphone port
- SDXC card slot
- Apple Thunderbolt to Gigabit Ethernet Adapter (sold separately)
- Apple Thunderbolt to FireWire Adapter (sold separately, available July)

## Wireless

- 802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible
- Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Support for Apple iPhone headset with remote and microphone
  - Support for audio line out

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 7 hours wireless web
- Up to 30 days standby time
- Built-in 95-watt-hour lithium-polymer battery
- 85W MagSafe 2 Power Adapter with cable management system; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## OS X Lion

Includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more.

## Included Software

**OS X Mountain Lion. Coming soon.** Buy a new Mac now and get a free upgrade to the next release of OS X when it arrives this summer. [Learn more.](#)

## iLife

Includes iPhoto, iMovie, and GarageBand. [Learn more about iLife.](#)

# 653\_MacBook Pro (Retina, 15-inch, Mid 2012) - Technical Specifications.pdf

**Limited Warranty and Service** Your MacBook Pro with Retina display comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

**In the Box**

- MacBook Pro with Retina display
- 85W MagSafe 2 Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

Configure your MacBook Pro to order with these options, only at the [Apple Online Store](#):

**Configure to Order**

- 2.7GHz quad-core Intel Core i7 (Turbo Boost up to 3.7GHz)
- 16GB memory upgrade
- 768GB of flash storage

## MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more.](#)

**MacBook Pro is designed with the following features to reduce environmental impact:**

- Highly recyclable aluminum enclosure
- Mercury-free LED backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Reduced packaging volume
- Meets ENERGY STAR Version 5.2 requirements

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. The [Apple Product Environmental Specification](#) details the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. Learn more about [how to recycle your Mac](#).

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	2.6 GHz	2.3 GHz	2.6 GHz	2.3 GHz
Idle	2.5	2.5	9	8
Hard drive accessing	N/A	N/A	N/A	N/A
CD drive accessing	N/A	N/A	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Available Accessories

## Mac Software

- iWork

# 653\_MacBook Pro (Retina, 15-inch, Mid 2012) - Technical Specifications.pdf

- Aperture
- Logic Pro
- Final Cut Pro X

## **Displays and Adapters**

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

## **AirPort and Wireless**

- AirPort Express
- AirPort Extreme Base Station
- Time Capsule

## **Other Accessories**

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- 85W MagSafe 2 Power Adapter
- AppleCare Protection Plan

Published Date: Feb 4, 2013

# OS X Mountain Lion - Technical Specifications

## General Requirements

- OS X v10.6.8 or later
- 2GB of memory
- 8GB of available space
- Some features require an Apple ID; terms apply.
- Some features require a compatible Internet service provider; fees may apply.

## Supported Models

- iMac (Mid 2007 or newer)
- MacBook (Late 2008 Aluminum, or Early 2009 or newer)
- MacBook Pro (Mid/Late 2007 or newer)
- Xserve (Early 2009)
- MacBook Air (Late 2008 or newer)
- Mac mini (Early 2009 or newer)
- Mac Pro (Early 2008 or newer)

## Feature-Specific Requirements

### Time Machine

Requires an additional hard drive or [Time Capsule](#) (sold separately).

### Photo Booth

Requires a FaceTime or iSight camera (built in or external), USB video class (UVC) camera, or FireWire DV camcorder. Backdrop effects when using a DV camcorder require fixed focus, exposure, and white balance.

### FaceTime

Video calls require a built-in FaceTime camera, an iSight camera (built in or external), a USB video class (UVC) camera, or a FireWire DV camcorder, and a 128-Kbps upstream and downstream Internet connection. Making HD video calls requires a built-in FaceTime HD camera and a 1-Mbps upstream and downstream Internet connection. Receiving HD video calls requires a supported Intel-based Mac.

### AirDrop

Supports the following Mac models:

- MacBook Pro (Late 2008 or newer)
- MacBook Air (Late 2010 or newer)
- MacBook (Late 2008 or newer)
- iMac (Early 2009 or newer)
- Mac mini (Mid 2010 or newer)
- Mac Pro (Early 2009 with AirPort Extreme card, or Mid 2010)

### Boot Camp

Supports existing Boot Camp installations with Windows XP Service Pack 2, Windows Vista, or Windows 7. New Boot Camp installations require Windows 7 (sold separately).

### Exchange Support

Requires Microsoft Exchange Server 2007 Service Pack 1 Update Rollup 4 or Exchange Server 2010. Auto-setup requires enabling the Autodiscovery feature of Microsoft Exchange Server.

### AirPlay Mirroring

Requires a second-generation Apple TV or later. Supports the following Mac models:

- iMac (Mid 2011 or newer)
- Mac mini (Mid 2011 or newer)
- MacBook Air (Mid 2011 or newer)
- MacBook Pro (Early 2011 or newer)

### Power Nap

Supports MacBook Air (Mid 2011 or newer), MacBook Pro with Retina display.

### Gestures

Requires a Multi-Touch trackpad, Magic Trackpad, or Magic Mouse.

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## **VoiceOver Gestures**

Requires a Multi-Touch trackpad or Magic Trackpad.

## **Mac App Store**

Available only to persons age 13 or older in the U.S. and many other countries. Requires compatible hardware and software and Internet access; broadband recommended (fees may apply). Terms apply.

## **Dictation**

Requires a microphone (built in or external) and a broadband Internet connection.

## **What's Included**

### **Applications**

- Automator
- Calculator
- Calendar
- Chess
- Contacts
- Dashboard
- Dictionary
- DVD Player
- FaceTime
- Font Book
- Image Capture
- iTunes
- Launchpad
- Mac App Store
- Mail
- Messages
- Mission Control
- Notes
- Photo Booth
- Preview
- QuickTime Player
- Reminders
- Safari
- Stickies
- System Preferences
- TextEdit
- Time Machine

### **Utilities**

- Activity Monitor
- AirPort Utility
- AppleScript Editor
- Audio MIDI Setup
- Bluetooth File Exchange
- Boot Camp Assistant
- ColorSync Utility
- Console
- DigitalColor Meter
- Disk Utility
- Grab
- Grapher
- Keychain Access
- Migration Assistant
- Network Utility
- RAID Utility
- System Information
- Terminal
- VoiceOver Utility

### **Languages**

- English

# 654\_OS X Mountain Lion - Technical Specifications.pdf

- Japanese
- French
- German
- Spanish
- Italian
- Dutch
- Swedish
- Danish
- Norwegian
- Finnish
- Traditional Chinese
- Simplified Chinese
- Korean
- Brazilian Portuguese
- Portuguese (Portugal)
- Russian
- Polish
- Czech
- Turkish
- Hungarian
- Arabic
- Catalan
- Croatian
- Greek
- Hebrew
- Romanian
- Slovak
- Thai
- Ukrainian

[Learn more about applications and utilities](#)

## Documentation

- [OS X Mountain Lion Core Technologies Overview](#)
- [OS X Server Product Overview](#)

Published Date: Jul 30, 2012

# iPhone 5 - Technical Specifications

## Color

Black & Slate

White & Silver

black and slate, white and silver

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB

## Size and Weight<sup>2</sup>

- **Height:** 4.87 inches (123.8 mm)
- **Width:** 2.31 inches (58.6 mm)
- **Depth:** 0.30 inch (7.6 mm)
- **Weight:** 3.95 ounces (112 grams)

## Cellular and Wireless

- GSM model A1428\*: UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 4 and 17)
- CDMA model A1429\*: CDMA EV-DO Rev. A and Rev. B (800, 1900, 2100 MHz); UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 3, 5, 13, 25)
- GSM model A1429\*: UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 3, 5)
- 802.11a/b/g/n Wi-Fi (802.11n 2.4GHz and 5GHz)
- Bluetooth 4.0 wireless technology

## Location

- Assisted GPS and GLONASS
- Digital compass
- Wi-Fi
- Cellular

## Display

- Retina display
- 4-inch (diagonal) widescreen Multi-Touch display
- 1136-by-640-pixel resolution at 326 ppi
- 800:1 contrast ratio (typical)
- 500 cd/m2 max brightness (typical)
- Fingerprint-resistant oleophobic coating on front
- Support for display of multiple languages and characters simultaneously

## Camera, Photos, and Video

- 8-megapixel iSight camera
- Panorama
- Video recording, HD (1080p) up to 30 frames per second with audio



# 655\_iPhone 5 - Technical Specifications.pdf

- FaceTime HD camera with 1.2MP photos and HD video (720p) up to 30 frames per second
- Autofocus
- Tap to focus video or still images
- Face detection in video or still images
- LED flash
- Improved video stabilization
- Photo and video geotagging

## External Buttons and Connectors

External Buttons and Controls

Connectors and Input/Output

buttons and controls

## Power and Battery<sup>3</sup>

- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter
- Talk time: Up to 8 hours on 3G
- Standby time: Up to 225 hours
- Internet use: Up to 8 hours on 3G, up to 8 hours on LTE, up to 10 hours on Wi-Fi
- Video playback: Up to 10 hours
- Audio playback: Up to 40 hours

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay mirroring and video out to Apple TV (2nd and 3rd generation)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 1080p, 30 frames per second, High Profile level 4.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Headphones

- Apple EarPods with Remote and Mic
- Storage and travel case

## Rating for Hearing Aids

- iPhone 5 (Model A1428): M3, T4
- iPhone 5 (Model A1429): M4, T4

## Mail Attachment Support

- **Viewable Document Types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact

# 655\_iPhone 5 - Technical Specifications.pdf

information); .xls and .xlsx (Microsoft Excel)

## Sensors

- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>4</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X v10.6.8 or later
  - PC: Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
  - iTunes 10.7 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Languages

### • Language Support

English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • Keyboard Support

English (U.S.), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Tibetan, Turkish, Ukrainian, Vietnamese

### • Dictionary Support (enables predictive text and autocorrect)

English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, French (Canadian), French (Switzerland), German, Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Indonesian, Latvian, Lithuanian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • Siri Languages

English (U.S., UK, Canada, Australia), Spanish (U.S., Mexico, Spain), French (France, Canada, Switzerland), German (Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong)

## In the Box

- iPhone 5
- Apple EarPods with Remote and Mic
- Lightning to USB Cable
- USB Power Adapter
- Documentation

## Accessories

### Lightning to 30-pin Adapter

Connect your current accessories to iPhone 5 using this adapter.

# 655\_iPhone 5 - Technical Specifications.pdf

## Apple World Travel Adapter Kit

Plug your Apple power adapter into most electrical outlets around the world.

## Other Accessories

- Lightning to 30-pin Adapter (0.2 m)
- Lightning to USB Cable
- Apple USB Power Adapter
- Apple EarPods

See more accessories in the [Apple Online Store](#)

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iPhone embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:**

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Recyclable aluminum enclosure
- Power adapter outperforms strictest global energy efficiency standards

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPhone.

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\*To identify your iPhone 5 model number, see <http://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see <http://www.apple.com/iphone/LTE>.

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Actual size and weight vary by configuration and manufacturing process.
3. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/batteries/iphone.html](http://www.apple.com/batteries/iphone.html) for more information.
4. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Some features, applications, and services are not available in all areas. See your carrier for details. Application availability and pricing are subject to change.

Published Date: Oct 14, 2016

# iPod nano (7th generation) - Technical Specifications



## Colors

- Space Gray
- Gold
- Silver
- Pink
- Blue
- Red - (PRODUCT)RED

## Capacity<sup>1</sup>

- 16GB

## Size and Weight

- Height: 3.01 inches (76.5 mm)
- Width: 1.56 inches (39.6 mm)
- Depth: 0.21 inch (5.4 mm)
- Weight: 1.1 ounces (31 grams)<sup>2</sup>
- True volume: 0.95 cu. inch (15,537 cu. mm)

## Display

- 2.5-inch (diagonal) widescreen Multi-Touch display
- 240-by-432-pixel resolution at 202 pixels per inch

## Wireless

- Bluetooth 4.0
- Nike+ support

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## External Buttons and Connectors

- Home
- Volume Down
- Play/Pause
- Volume Up
- On/Off - Sleep/Wake
- 3.5 mm headphone jack

# 656\_iPod nano (7th generation) - Technical Specifications.pdf

- Lightning connector

## Video Format Support

- H.264 video: 720 by 576 pixels, 30 frames per second; Baseline, Main, and High-Profile level 3.0 with AAC-LC audio up to 256 Kbps; 48kHz; stereo audio in .m4v, .mp4, and .mov file formats
- MPEG-4 video: up to 2.5 Mbps, 720 by 576 pixels, 30 frames per second; Simple Profile with AAC-LC audio up to 256 Kbps; 48kHz; stereo audio in .m4v, .mp4, and .mov file formats

## FM Radio

- Regional settings for Americas, Asia, Australia, Europe, and Japan
- Live Pause feature for pausing a radio broadcast and rewinding (within a 15-minute buffer)

## Sensor

- Accelerometer

## Power and Battery<sup>3</sup>

- Built-in rechargeable lithium-ion battery
- Music playback time: Up to 30 hours
- Video playback time: Up to 3.5 hours
- Charging via USB to computer system or power adapter (sold separately)

## Languages

- **35 UI languages:**  
Arabic, Brazilian Portuguese, British English, Cantonese (Traditional Chinese), Catalan, Croatian, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hebrew, Hungarian, Indonesian, Italian, Japanese, Korean, Malay, Norwegian, Polish, Portuguese, Romanian, Russian, Simplified Chinese, Slovak, Spanish, Swedish, Thai, Traditional Chinese, Turkish, Ukrainian, Vietnamese. For Arabic and Hebrew, some UI elements are not right to left.
- **Fitness spoken feedback is available in seven languages:**  
Chinese (Mandarin), English (U.S.), French (France), German, Italian, Japanese, Spanish (Spain).
- **29 VoiceOver languages:**  
Chinese (Cantonese, Mandarin), Czech, Danish, Dutch, English (Australia, UK, U.S.), Finnish, French (Canada, France), German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Spanish (Mexico, Spain), Swedish, Thai, Turkish.

## Headphones

- Apple EarPods<sup>4</sup>

## Accessibility

- VoiceOver gesture-based screen reader
- High-resolution LCD display with adjustable backlight settings for easier reading in low light
- Invert Colors
- Mono Audio

## System Requirements

- Mac: USB 2 or 3 port, OS X v10.7.5 or later, and iTunes 12.2 or later<sup>5</sup>
- PC: USB 2 port, Windows 7 or later, and iTunes 12.2 or later<sup>5</sup>
- Internet access required; broadband recommended; fees may apply

## Environmental Requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## In the Box

# 656\_iPod nano (7th generation) - Technical Specifications.pdf

- iPod nano
- Apple EarPods
- Lightning to USB Cable
- Quick Start guide

## iPod nano and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPod nano is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- Mercury-free
- PVC-free
- Recyclable aluminum enclosure

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Recycling

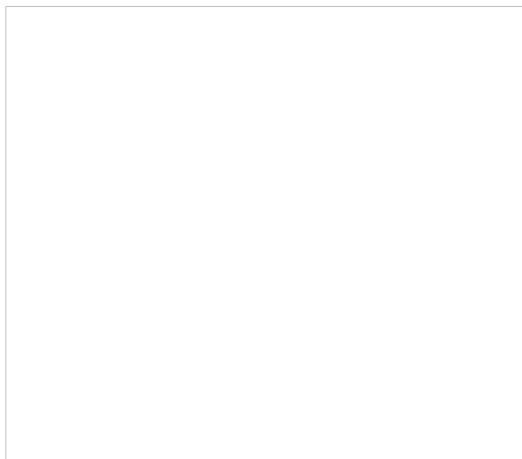
Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPod nano.

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Testing conducted by Apple in August 2012 using preproduction iPod nano hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (256-Kbps AAC); video content was purchased from the iTunes Store. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced (see [www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  4. Remote and mic not included.
  5. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Aug 10, 2017

# iPod touch (5th generation) - Technical Specifications

## Size and Weight



- **Height:** 4.86 inches (123.4 mm)
- **Width:** 2.31 inches (58.6 mm)
- **Depth:** 0.24 inch (6.1 mm)
- **Weight:** 3.10 ounces (88 grams)<sup>1</sup>

## Capacity<sup>2</sup>

- 32GB
- 64GB

## Wireless<sup>3</sup>

- 802.11a/b/g/n Wi-Fi (802.11n 2.4GHz and 5GHz)
- Bluetooth 4.0
- Maps: Location-based service<sup>4</sup>

## Display

- 4-inch (diagonal) widescreen display with Multi-Touch IPS technology
- Retina display
- 1136-by-640-pixel resolution at 326 pixels per inch
- 800:1 contrast ratio (typical)
- 500 cd/m2 max brightness (typical)
- Fingerprint-resistant oleophobic coating

## Camera, Photos, and Video

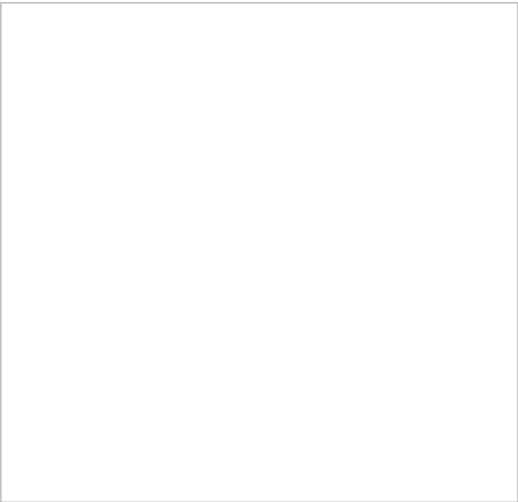
- 5-megapixel iSight camera
- Autofocus
- Tap to focus video or still images
- Backside illumination
- Hybrid IR filter
- Five-element lens
- LED flash
- *f*/2.4 aperture
- Face detection
- Panorama
- HDR
- HD video recording (1080p) up to 30 frames per second with audio
- FaceTime HD camera with 1.2MP photos and HD video (720p) up to 30 frames per second
- Video stabilization
- Tap to control exposure for video or stills
- Photo and video geotagging over Wi-Fi

**Input and Output**

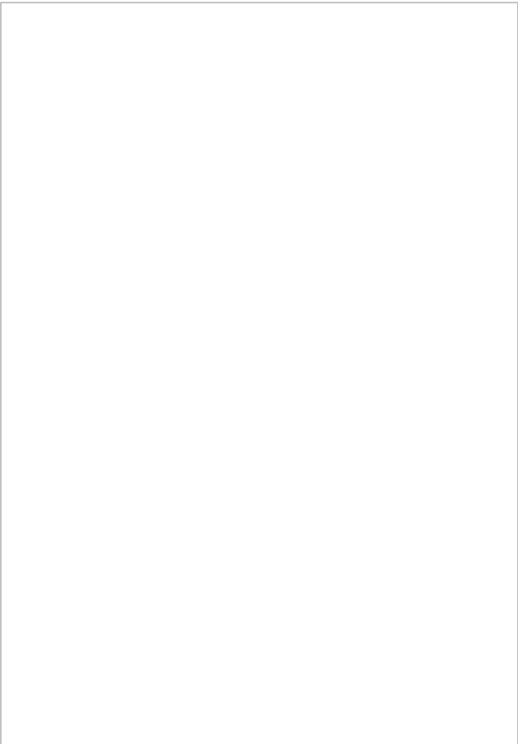
- Lightning connector
- 3.5-mm stereo headphone jack
- Built-in speaker
- Microphone

**External Buttons and Connectors**

- External Buttons and Controls



- Connectors and Input/Output



**Power and Battery<sup>5</sup>**

- Built-in rechargeable lithium-ion battery
- Music playback time: Up to 40 hours when fully charged
- Video playback time: Up to 8 hours when fully charged
- Charging times: Fast charge in about 2 hours (80% capacity), full charge in about 4 hours

**Audio Playback**

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR,



# 657\_iPod touch (5th generation) - Technical Specifications.pdf

Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV

- User-configurable maximum volume limit

## TV and Video

- H.264 video up to 720p, 30 frames per second, Main Profile level 3.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format
- AirPlay Mirroring to Apple TV support at 720p
- AirPlay video streaming to Apple TV (3rd generation) at up to 1080p and Apple TV (2nd generation) at up to 720p

## Headphones

- Apple EarPods



## Sensors

- Three-axis gyro
- Accelerometer

## System Requirements

- Apple ID (required for some features)
- Internet access
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X v10.6.8 or later
  - PC: Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
  - iTunes 10.7 or later<sup>6</sup> (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Languages

### Language Support

English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### Keyboard Support

English (U.S.), English (Australian), English (Canadian), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese (Portugal), Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Tibetan, Turkish, Ukrainian, Vietnamese

### Dictionary Support

English (U.S.), English (Australian), English (Canadian), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian,

# 657\_iPod touch (5th generation) - Technical Specifications.pdf

Macedonian, Malay, Norwegian, Polish, Portuguese (Portugal), Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

## Siri Languages

English (U.S., UK, Canada, Australia), Spanish (U.S., Mexico, Spain), French (France, Canada, Switzerland), German (Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong)

## In the Box

- iPod touch
- iPod touch loop
- Apple EarPods
- Lightning to USB Cable
- Quick Start guide

## Accessories

### Lightning to 30-pin Adapter

Connect your current accessories to iPod touch using this adapter.

### Apple World Travel Adapter Kit

Plug your Apple power adapter into most electrical outlets around the world.

### Other Accessories

- *Lightning to 30-pin Adapter (0.2 m)*
- *Lightning to USB Cable*
- *AppleCare Protection Plan*
- *Apple USB Power Adapter*
- *Apple EarPods*

[See more accessories in the Apple Online Store](#)

## iPod touch and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iPod touch embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:**

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Recyclable aluminum enclosure

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPod touch.

- 
1. Weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Internet access required; broadband recommended; fees may apply.
  4. For iPod touch with Maps, the Maps application provides your approximate location using information based on your proximity to known Wi-Fi networks (when on and available). The more accurate the available information, the smaller the circle identifying your position on the map. The feature is not available in all areas. Known Wi-Fi networks are predominantly in urban areas. In order to provide your location, data is collected in a form that does not personally identify you. If you do not want such data collected, do not enable the feature. Not enabling the feature will not impact the functionality of your iPod touch.
  5. Testing conducted by Apple in August 2012 using preproduction iPod touch hardware and software. The playlist contained 358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (256-Kbps AAC); video content was purchased from the iTunes Store. iPod units were associated to a Wi-Fi network; all other settings were default. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced ([www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles

# 657\_iPod touch (5th generation) - Technical Specifications.pdf

vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

6. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: Nov 1, 2017

# MacBook Pro (Retina, 13-inch, Late 2012) - Technical Specifications

## Display

- Retina display: 13.3-inch (diagonal) LED-backlit display with IPS technology
- 2560-by-1600 native resolution at 227 pixels per inch with support for millions of colors
- Scaled resolutions: 1680 by 1050, 1440 by 900, and 1024 by 640 pixels

## Processor

### **2.5GHz**

2.5GHz dual-core Intel Core i5 processor (Turbo Boost up to 3.1GHz) with 3MB shared L3 cache

- Configurable to 2.9GHz dual-core Intel Core i7 (Turbo Boost up to 3.6GHz) with 4MB shared L3 cache.

## Memory

- 8GB of 1600MHz DDR3L onboard memory

## Storage

- **128GB**  
Configurable to 256GB, 512GB, or 768GB flash storage.
- **256GB**  
Configurable to 512GB or 768GB flash storage.

## Size and Weight

- Height: 0.75 inch (1.9 cm)
- Width: 12.35 inches (31.4 cm)
- Depth: 8.62 inches (21.9 cm)
- Weight: 3.57 pounds (1.62 kg)<sup>2</sup>

## Graphics and Video Support

- Intel HD Graphics 4000
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on up to two external displays, at millions of colors

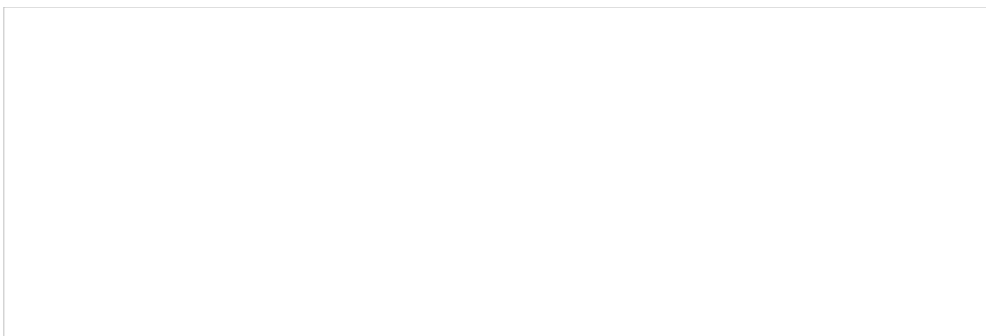
### **Thunderbolt digital video output**

- Native Mini DisplayPort output
- DVI output using Mini DisplayPort to DVI Adapter (sold separately)
- VGA output using Mini DisplayPort to VGA Adapter (sold separately)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)

## Camera

- 720p FaceTime HD camera

## Connections and Expansion



- MagSafe 2 power port
- Two Thunderbolt ports (up to 10 Gbps)
- Two USB 3 ports (up to 5 Gbps)
- HDMI port
- Headphone port
- SDXC card slot
- Apple Thunderbolt to FireWire Adapter (sold separately)
- Apple Thunderbolt to Gigabit Ethernet Adapter (sold separately)

## Wireless

- **Wi-Fi**  
802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power

- Up to 7 hours wireless web
- Up to 30 days standby time
- Built-in 74-watt-hour lithium-polymer battery
- 60W MagSafe 2 Power Adapter with cable management system; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 113° F (–24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Included Software

- OS X Mountain Lion: The world’s most advanced desktop operating system. [Learn more](#)
- Mac App Store
- Safari

- Mail
- Messages
- Calendar
- Contacts
- Reminders
- Notes
- Time Machine
- FaceTime
- Photo Booth
- Game Center
- iTunes
- iLife: iPhoto, iMovie, and GarageBand.

## Limited Warranty and Service

Your MacBook Pro with Retina display comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Pro with Retina display
- MagSafe 2 Power Adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Pro to order with these options, only at the [Apple Online Store](#):

- 2.9GHz dual-core Intel Core i7 (Turbo Boost up to 3.6GHz) with 4MB shared L3 cache
- 256GB, 512GB, or 768GB of flash storage

## MacBook Pro with Retina display and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**MacBook Pro with Retina display is designed with the following features to reduce its environmental impact:**

- Highly recyclable aluminum enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>6</sup>
- Packaging volumes reduced by 25 percent for up to a 45 percent reduction in aircraft usage.

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Idle	2.5	6.0

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Hard drive accessing	N/A	N/A
CD drive accessing	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- *iWork*
- *Aperture*
- *Logic Pro*
- *Final Cut Pro X*

### Displays and Adapters

- *Apple Thunderbolt Display*
- *Apple Mini DisplayPort to DVI Adapter*
- *Apple Mini DisplayPort to VGA Adapter*
- *Apple Mini DisplayPort to Dual-Link DVI Adapter*>
- *MagSafe to MagSafe 2 Converter*

### AirPort and Wireless

- *AirPort Express Base Station*
- *AirPort Extreme Base Station*
- *Time Capsule*

### Other Accessories

- *Apple USB SuperDrive*
- *Thunderbolt to Gigabit Ethernet Adapter*
- *Thunderbolt to FireWire Adapter*
- *60W MagSafe 2 Power Adapter*
- *85W MagSafe 2 Power Adapter*
- *AppleCare Protection Plan*

- 
1. 1GB=1 billion bytes; actual formatted capacity less.
  2. Actual weight varies by configuration and manufacturing process.
  3. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  4. Testing conducted by Apple in May 2012 using preproduction 2.6GHz quad-core Intel Core i7-based 15-inch MacBook Pro units. Testing conducted by Apple in September 2012 using preproduction 2.5GHz dual-core Intel Core i5-based 13-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. The standby test measures battery life by allowing a system, connected to a wireless network, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. PVC-free AC power cord available in all regions except China and South Korea.
  6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 14, 2016

# Mac mini (Late 2012) - Technical Specifications

## Size and Weight

- *Height:* 1.4 inches (3.6 cm)
- *Width:* 7.7 inches (19.7 cm)
- *Depth:* 7.7 inches (19.7 cm)
- *Weight:* 2.7 pounds (1.22 kg)<sup>1</sup>

## Processor

### **2.5GHz**

2.5GHz dual-core Intel Core i5 (Turbo Boost up to 3.1GHz) with 3MB L3 cache

### **2.3GHz**

2.3GHz quad-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 6MB L3 cache

- Configurable to 2.6GHz quad-core Intel Core i7 (Turbo Boost up to 3.6GHz).

## Storage

### **2.5 GHz**

500GB (5400-rpm) hard drive<sup>2</sup>

### **2.3GHz**

1TB (5400-rpm) hard drive<sup>2</sup>

- Configurable to a 256GB solid-state drive or 1TB Fusion Drive.

## Graphics

- Intel HD Graphics 4000

## Memory

- 4GB (two 2GB) of 1600MHz DDR3 memory
  - Configurable to 8GB or 16GB.

## Video Support

Support for up to two displays at 2560 by 1600 pixels, both at millions of colors

### **Thunderbolt digital video output**

- Native Mini DisplayPort output
- DVI output using Mini DisplayPort to DVI Adapter (sold separately)
- VGA output using Mini DisplayPort to VGA Adapter (sold separately)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)

### **HDMI video output**

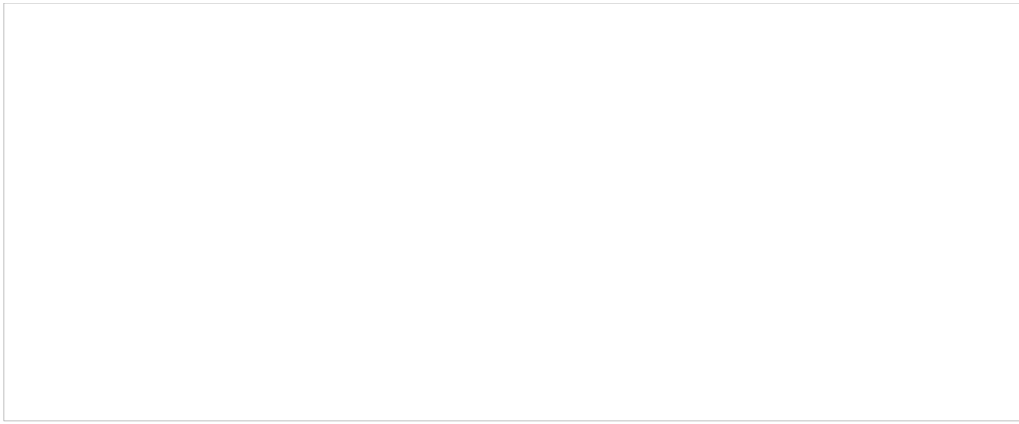
- Support for 1080p resolution at up to 60Hz

DVI output using HDMI to DVI Adapter (sold separately)

## Audio

- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- HDMI port supports multichannel audio output
- Support for Apple iPhone headset with microphone
- Built-in speaker





## Connections and Expansion

- Thunderbolt port (up to 10 Gbps)
- FireWire 800 port (up to 800 Mbps)
- Four USB 3 ports (up to 5 Gbps)
- HDMI port
- SDXC card slot
- Gigabit Ethernet port
- Audio in/out
- IR receiver

## Communications

### Wi-Fi

802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible

### Bluetooth

Bluetooth 4.0 wireless technology

### Ethernet

10/100/1000BASE-T Ethernet (RJ-45 connector)

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 85W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet
- Typical acoustical performance, sound pressure level (operator position):<sup>4</sup>
  - Dual-core model: 12 dBA at idle
  - Quad-core model: 15 dBA at idle

## Limited Warranty and Service

Your Mac mini comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the [AppleCare Protection Plan](#) provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- Mac mini
- HDMI to DVI Adapter
- Power cord

## Included Software

- OS X Mountain Lion: The world's most advanced desktop operating system. [Learn more](#)

# 659\_Mac mini (Late 2012) - Technical Specifications.pdf

- Mac App Store
- Safari
- Mail
- Messages
- Calendar
- Contacts
- Reminders
- Notes
- Time Machine
- FaceTime
- Photo Booth
- Game Center
- iTunes
- iLife: iPhoto, iMovie, and GarageBand.

## Configure to Order

Configure your Mac mini with these options, only at the [Apple Online Store](#).

- 8GB DDR3 memory upgrade
- 16GB DDR3 memory upgrade
- Apple Remote
- 2.6GHz quad-core Intel Core i7 processor
- 8GB DDR3 memory upgrade
- 16GB DDR3 memory upgrade
- 256GB solid-state drive
- 1TB Fusion Drive
- Apple Remote

## Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**Mac mini is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>5</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>6</sup>

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac or PC.](#)

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	2.3GHz	2.5GHz	2.3GHz	2.5GHz
Idle	2.6	2.6	14	12
Hard drive accessing	2.7	2.6	16	14
CD drive accessing	N/A	N/A	N/A	N/A

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Pro
- Final Cut Pro X

### Displays and Graphics

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort and Wireless

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station
- Apple Magic Trackpad
- Apple Wireless Keyboard
- Apple Magic Mouse

### Other Accessories

- Apple USB SuperDrive
- Apple Keyboard
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  3. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  4. Acoustics measured from typical operator position sitting in front of standard Mac mini system. Acoustics may vary by configuration.
  5. PVC-free in all countries except China, Korea, and South Africa.
  6. Mac mini achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Jan 10, 2017

# Mac mini (original) - Technical Specifications

Mac mini (orig.) - Technical Specifications

Configurations	1.25GHz Mac mini	1.42GHz Mac mini	SuperDrive Mac mini
Model	M9686LL/B	M9687LL/B	M9971LL/B
Processor	1.25GHz PowerPC G4	1.42GHz PowerPC G4	
Memory	512MB of PC2700 (333MHz) DDR SDRAM, supports up to 1GB		
Graphics	ATI Radeon 9200 with 32MB of DDR SDRAM with AGP 4X support		
Hard drive <sup>1</sup>	40GB Ultra ATA <sup>1</sup>	80GB Ultra ATA <sup>1</sup>	
Optical drive	Slot-loading Combo Drive (DVD-ROM/CD-RW)		Slot-loading SuperDrive (DVD±RW/CD-RW)
Ports	One FireWire 400 port; two USB 2.0 ports; DVI output; VGA output (adapter included)		
Networking	Built-in 10/100BASE-T Ethernet and 56K V.92 modem <sup>2</sup>	Built-in 10/100BASE-T Ethernet (56K V.92 modem available as build-to-order option)	
Wireless	Airport Extreme and Bluetooth available as build-to-order option	Built-in AirPort Extreme (based on 802.11g specification; IEEE 802.11b Wi-Fi certified) <sup>3</sup> ; internal Bluetooth	
Audio	Headphone/audio line out		
System software	Mac OS X version 10.4 Tiger		
Software	iLife '05 (includes iTunes, iPhoto, iMovie HD, iDVD, GarageBand), Mail, Dashboard, Spotlight, iChat, Safari, Sherlock, QuickTime, iSync, iCal, DVD Player, Address Book, AppleWorks, iWork (30-day trial), Classic environment, Quicken 2005 for Macintosh, Nanosaur 2, Marble Blast Gold, Microsoft Office 2004 for Mac Test Drive, Zinio Reader, XCode Developer Tools and Apple Hardware Test		
Limited warranty and service	Your Mac mini comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.		

Build-to-Order Options	Order a custom-configured computer from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Memory	Up to 1GB <sup>5</sup>
DVD	Slot-loading SuperDrive (DVD±RW/CD-RW) Apple 4x DVD-R Media Kit
Hard Drive	80GB internal hard drive
Input	Apple Keyboard M9034LL/A Apple Mouse M9035G/A Apple Wireless Keyboard (requires Bluetooth module) M9270LL/A Apple Wireless Mouse (requires Bluetooth module) M9269Z/A
Cables and adapters	Apple DVI to Video Adapter M9267G/A Apple FireWire Cable (4-pin to 6-pin) M8706G/A
Audio	Apple iPod
Wireless	AirPort Extreme Card Internal Bluetooth module AirPort Express Featuring AirTunes M9470LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A D-Link USB Bluetooth Adapter T6295ZM/A
Services	AppleCare Protection Plan M9859LL/A .Mac Subscription M9495Z/A

## Technical Specifications

### Processor and memory

- 1.25GHz or 1.42GHz PowerPC G4 processor with Velocity Engine
- 512K on-chip level 2 cache at full processor speed
- 167MHz system bus
- 512MB of PC2700 (333MHz) DDR SDRAM, expandable to up to 1GB<sup>5</sup>

### Storage

- 40 or 80GB Ultra ATA hard disk drive<sup>1</sup>
- One of the following optical drives:
  - Slot-loading Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed
  - Optional SuperDrive (DVD±RW/CD-RW): writes DVD-R discs at up to 4x speed, writes DVD-RW discs

# 65\_Mac mini (original) - Technical Specifications.pdf

at up to 2x speed, writes DVD+R discs at up to 4x speed, writes DVD+RW discs at up to 2.4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 24x speed

## Audio

- Built-in speaker
- Headphone/Audio Line-out jack

## Graphics support

- ATI Radeon 9200 graphics processor with AGP 4X support
- 32MB of dedicated Double Data Rate (DDR) video memory

## Video

- DVI video output for digital resolutions up to 1920 x 1200 pixels; supports 20-inch Apple Cinema display and 23-inch Apple Cinema HD display; supports coherent digital displays up to 154MHz; supports non-coherent digital displays up to 135MHz
- VGA video output (using included adapter) to support analog resolutions up to 1920 x 1080 pixels
- S-video and composite video output to connect directly to a TV or projector (requires Apple DVI to Video Adapter, sold separately)

## Peripheral connections

- One FireWire 400 port; 8 watts
- Two USB 2.0 ports (up to 480 Mbps) on computer

## Communications

- 56K V.92 modem (RJ-11 connector) standard on some configurations, optional on others<sup>2</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Internal 54-Mbps AirPort Extreme Card (based on IEEE 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) standard on some configurations, optional on others<sup>3</sup>
- Internal Bluetooth standard on some configurations, optional on others

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 85W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Size and weight

- Height: 2 inches (5.08 cm)
- Width: 6.5 inches (16.51 cm)
- Depth: 6.5 inches (16.51 cm)
- Weight: 2.9 pounds (1.32 kg)<sup>4</sup>

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower.

3. Wireless Internet access requires AirPort Extreme; AirPort, AirPort Express or AirPort Extreme Base Station; and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.

4. Weight varies by configuration and manufacturing process.

5. Memory, AirPort Extreme and internal Bluetooth upgrades must be performed by an Apple Authorized Service provider; fees may apply.

Internet access requires a compatible Internet service provider; fees may apply.

Product contains electronic documentation.

Backup copy of software is included.

Product specifications are subject to change without notice.

Published Date: Dec 21, 2012

# Mac mini Server (Late 2012) - Technical Specifications

## Size and Weight

- Height: 1.4 inches (3.6 cm)
- Width: 7.7 inches (19.7 cm)
- Depth: 7.7 inches (19.7 cm)
- Weight: 2.9 pounds (1.3 kg)<sup>1</sup>

## Processor

- 2.3GHz quad-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 6MB L3 cache
  - Configurable to 2.6GHz quad-core Intel Core i7 (Turbo Boost up to 3.6GHz).

## Storage

- Two 1TB (5400-rpm) hard drives<sup>2</sup>  
Configurable to one or two 256GB solid-state drives.

## Graphics

- Intel HD Graphics 4000

## Memory

- 4GB (two 2GB) of 1600MHz DDR3 memory  
Configurable to 8GB or 16GB.

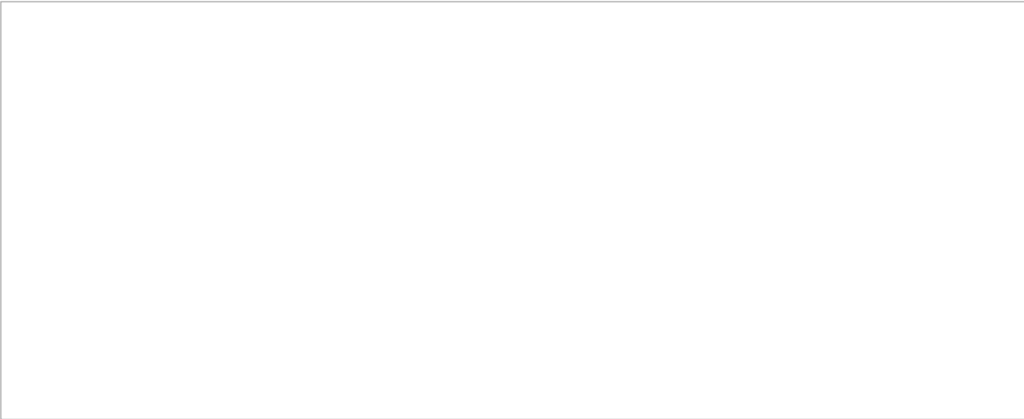
## Video Support

- **Thunderbolt digital video output**
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)

## Audio

- Audio line in minijack (digital/analog)
- Audio line out/headphone minijack (digital/analog)
- HDMI port supports multichannel audio output
- Support for Apple iPhone headset with microphone
- Built-in speaker

## Connections and Expansion



- Thunderbolt port (up to 10 Gbps)
- FireWire 800 port (up to 800 Mbps)
- Four USB 3 ports (up to 5 Gbps)
- HDMI port

# 660\_Mac mini Server (Late 2012) - Technical Specifications.pdf

- SDXC card slot
- Gigabit Ethernet port
- Audio in/out
- IR receiver

## Communications

- **Wi-Fi**  
802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology
- **Ethernet**  
10/100/1000BASE-T Ethernet (RJ-45 connector)

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 85W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet
- Typical acoustical performance, sound pressure level (operator position):<sup>4</sup>
  - 16 dBA at idle

## Limited Warranty and Service

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## In the Box

- Mac mini
- HDMI to DVI Adapter
- Power cord

## Included Software

- OS X Server: Includes Server, Xsan, File Server, Calendar Server, Contacts Server, Mail Server, Web Server, NetInstall, DNS, DHCP, Open Directory, Profile Manager, VPN Server, and Wiki Server. [Learn more about OS X Server](#)
  - File Sharing
  - Profile Manager
  - Time Machine
  - Wiki Server
  - Calendar Server
  - Contacts Server
  - Mail Server
  - Messages Server
  - Xsan 3
  - VPN Server
  - Software Update Server
- OS X Mountain Lion: The world's most advanced desktop operating system. [Learn more](#)
  - Mac App Store
  - Safari
  - Mail
  - Messages
  - Calendar
  - Contacts
  - Reminders
  - Notes
  - Time Machine

- FaceTime
- Photo Booth
- Game Center
- iTunes
- iLife: iPhoto, iMovie, and GarageBand.

## Configure to Order

Configure your Mac mini with these options, only at the [Apple Online Store](#).

- 2.6GHz quad-core Intel Core i7 processor
- 8GB DDR3 memory upgrade
- 16GB DDR3 memory upgrade
- One or two 256GB solid-state drives
- Apple Remote

## Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**Mac mini is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>5</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>6</sup>

## Apple and the Environment

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DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Idle	2.7	14
Hard drive accessing	2.8	15
CD drive accessing	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Pro
- Final Cut Pro X

## Displays and Graphics

- Apple Thunderbolt Display



# 660\_Mac mini Server (Late 2012) - Technical Specifications.pdf

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

## AirPort and Wireless

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station
- Apple Magic Trackpad
- Apple Wireless Keyboard
- Apple Magic Mouse

## Other Accessories

- Apple USB SuperDrive
- Apple Keyboard
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  3. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  4. Acoustics measured from desktop server usage position of standard Mac mini with OS X Server system. Acoustics may vary by configuration.
  5. PVC-free in all countries except China, Korea, and South Africa.
  6. Mac mini achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 14, 2016

# iPad mini - Technical Specifications



## Color

- Black & Slate
- White & Silver

## Models

- Wi-Fi
- Wi-Fi + Cellular

## Size and Weight<sup>1</sup>

### Wi-Fi

- Height: 7.87 inches (200 mm)
- Width: 5.3 inches (134.7 mm)
- Depth: 0.28 inch (7.2 mm)
- Weight: 0.68 pound (308 g)

### Wi-Fi + Cellular

- Height: 7.87 inches (200 mm)
- Width: 5.3 inches (134.7 mm)
- Depth: 0.28 inch (7.2 mm)
- Weight: 0.69 pound (312 g)

## Storage<sup>2</sup>

- 16GB
- 32GB
- 64GB

## Wireless and Cellular

### Wi-Fi

- 802.11a/b/g/n Wi-Fi (802.11n 2.4GHz and 5GHz)
- Bluetooth 4.0 wireless technology

### Wi-Fi + Cellular

- Model A1454\*
  - GSM/EDGE (850, 900, 1800, 1900 MHz)
  - UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz)
  - LTE (Bands 4 and 17)
- Model A1455\*
  - CDMA EV-DO Rev. A and Rev. B (800, 1900, 2100 MHz)
  - GSM/EDGE (850, 900, 1800, 1900 MHz)
  - UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz)
  - LTE (Bands 1, 3, 5, 13, 25)

# 661\_iPad mini - Technical Specifications.pdf

- Data only<sup>3</sup>
- 802.11a/b/g/n Wi-Fi (802.11n 2.4GHz and 5GHz)
- Bluetooth 4.0 wireless technology

## Display

- 7.9-inch (diagonal) LED-backlit Multi-Touch display with IPS technology
- 1024-by-768 resolution at 163 pixels per inch (ppi)
- Fingerprint-resistant oleophobic coating

## Chip

- Dual-core A5

## Cameras, Photos, and Video Recording

### FaceTime HD Camera

- 1.2MP photos
- 720p HD video
- FaceTime video calling over Wi-Fi or cellular<sup>4</sup>
- Face detection
- Backside illumination
- Tap to control exposure for video or still images
- Photo and video geotagging

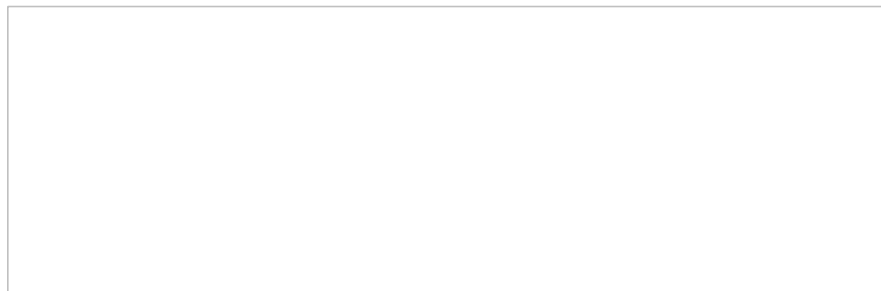
### iSight Camera

- 5MP photos
- Autofocus
- Face detection
- Backside illumination
- Five-element lens
- Hybrid IR filter
- *f*/2.4 aperture
- Tap to focus video or still images
- Tap to control exposure for video or still images
- Photo and video geotagging

### Video Recording

- 1080p HD video recording
- Video stabilization
- Face detection
- Tap to focus while recording
- Backside illumination

## External Buttons and Connectors



### External Buttons and Controls

- Home
- On/Off; Sleep/Wake
- Silent/Screen rotation lock
- Volume up/down

# 661\_iPad mini - Technical Specifications.pdf

## Connectors and Input/Output

- Microphone
- 3.5-mm stereo headphone minijack
- Lightning connector
- Built-in speaker

## Power and Battery<sup>5</sup>

### Wi-Fi

- Built-in 16.3-watt-hour rechargeable lithium-polymer battery
- Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
- Charging via power adapter or USB to computer system

### Wi-Fi + Cellular

- Built-in 16.3-watt-hour rechargeable lithium-polymer battery
- Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
- Up to 9 hours of surfing the web using cellular data network
- Charging via power adapter or USB to computer system

## Input/Output

### Wi-Fi

- Lightning connector
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Microphone

### Wi-Fi + Cellular

- Lightning connector
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Microphone
- Nano-SIM card tray

## Sensors

- Three-axis gyro
- Accelerometer
- Ambient light sensor

## Location

### Wi-Fi

- Wi-Fi
- Digital compass

### Wi-Fi + Cellular

- Wi-Fi
- Digital compass
- Assisted GPS and GLONASS
- Cellular

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

# 661\_iPad mini - Technical Specifications.pdf

- AirPlay Mirroring to Apple TV (2nd and 3rd generation) at 720p
- AirPlay video streaming to Apple TV (3rd generation) at up to 1080p and Apple TV (2nd generation) at up to 720p
- Video mirroring and video out support: Up to 720p through Lightning Digital AV Adapter and Lightning to VGA Adapter; video playback up to 1080p (sold separately)
- Video formats supported: H.264 video up to 1080p, 30 frames per second, High Profile level 4.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

Viewable document types: .jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel)

## Languages

- Language support for English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- Keyboard support for English (U.S.), English (Australian), English (Canadian), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese (Portugal), Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Tibetan, Turkish, Ukrainian, Vietnamese
- Dictionary support (enables predictive text and autocorrect) for English (U.S.), English (Australian), English (Canadian), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese (Portugal), Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- Siri language support for English (U.S., UK, Canada, Australia), Spanish (U.S., Mexico, Spain), French (France, Canada, Switzerland), German (Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong)

## Accessibility

- VoiceOver screen reader
- Guided Access
- Support for playback of closed-captioned content
- AssistiveTouch interface for adaptive accessories
- Full-screen zoom magnification
- Large text
- Option to invert colors
- Left/right volume adjustment

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>6</sup>
- **Syncing with iTunes on a Mac or PC requires:**
  - Mac: OS X v10.6.8 or later
  - PC: Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 2 or later
  - Download iTunes at [www.itunes.com/download](http://www.itunes.com/download)

## In the Box

- iPad mini
- Lightning to USB Cable
- USB Power Adapter

## Built-in Apps

- Safari
- Photos
- App Store
- Maps
- Photo Booth
- Reminders
- Camera
- Mail
- FaceTime
- iTunes
- Music
- Clock
- Calendar
- Messages
- Newsstand
- Videos
- Game Center
- Contacts
- Notes

## iPad mini and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iPad mini embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:**

- Mercury-free LCD display
- Arsenic-free display glass
- BFR-free
- PVC-free
- Recyclable aluminum enclosure

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPad mini.

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\*To identify your iPad model number, see <http://support.apple.com/HT5452>. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).

1. Actual size and weight vary by configuration and manufacturing process.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
4. FaceTime video calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
5. Testing conducted by Apple in October 2012 using preproduction iPad mini units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique songs, consisting of a combination of songs imported from CDs using iTunes (128-Kbps AAC encoding) and songs purchased from the iTunes Store (256-Kbps AAC encoding). Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific

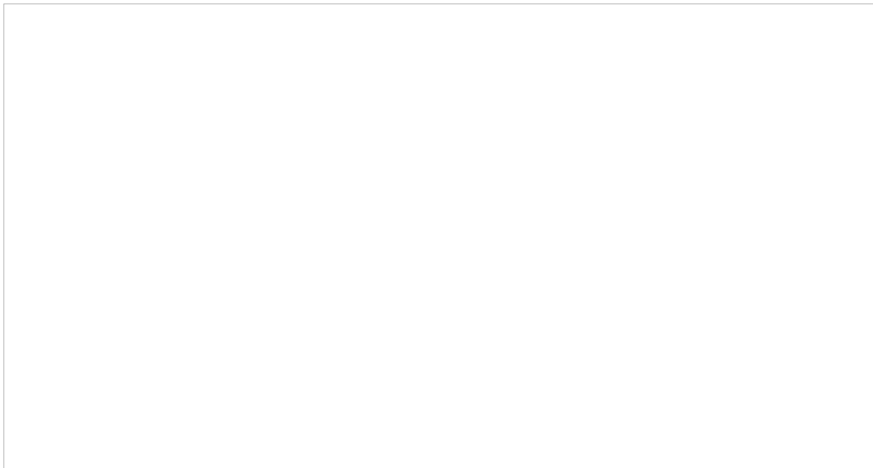
# 661\_iPad mini - Technical Specifications.pdf

iPad units; actual results may vary.

6. Wireless broadband recommended; fees may apply.

Published Date: Nov 1, 2017

# iPad (4th generation) - Technical Specifications



## Color

- Black
- White

## Models

- Wi-Fi
- Wi-Fi + Cellular

## Size and Weight <sup>1</sup>

### Wi-Fi

- Height: 9.50 inches (241.2 mm)
- Width: 7.31 inches (185.7 mm)
- Depth: 0.37 inch (9.4 mm)
- Weight: 1.44 pounds (652 g)

### Wi-Fi + Cellular

- Height: 9.50 inches (241.2 mm)
- Width: 7.31 inches (185.7 mm)
- Depth: 0.37 inch (9.4 mm)
- Weight: 1.46 pounds (662 g)

## Storage <sup>2</sup>

- 16GB
- 32GB
- 64GB
- 128GB

## Wireless and Cellular

### Wi-Fi

- 802.11a/b/g/n Wi-Fi (802.11n 2.4GHz and 5GHz)
- Bluetooth 4.0 wireless technology

### Wi-Fi + Cellular

- Model A1459\*
  - GSM/EDGE (850, 900, 1800, 1900 MHz)
  - UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz)
  - LTE (Bands 4 and 17)
- Model A1460\*



# 662\_iPad (4th generation) - Technical Specifications.pdf

- CDMA EV-DO Rev. A and Rev. B (800, 1900, 2100 MHz)
- GSM/EDGE (850, 900, 1800, 1900 MHz)
- UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz)
- LTE (Bands 1, 3, 5, 13, 25)
- Data only <sup>3</sup>
- 802.11a/b/g/n Wi-Fi (802.11n 2.4GHz and 5GHz)
- Bluetooth 4.0 wireless technology

## Display

- **Retina display**
- 9.7-inch (diagonal) LED-backlit Multi-Touch display with IPS technology
- 2048-by-1536 resolution at 264 pixels per inch (ppi)
- Fingerprint-resistant oleophobic coating

## Chip

- Dual-core A6X with quad-core graphics

## Cameras, Photos, and Video Recording

### FaceTime HD Camera

- 1.2MP photos
- 720p HD video
- FaceTime video calling over Wi-Fi or cellular <sup>4</sup>
- Face detection
- Backside illumination
- Tap to control exposure for video or still images
- Photo and video geotagging

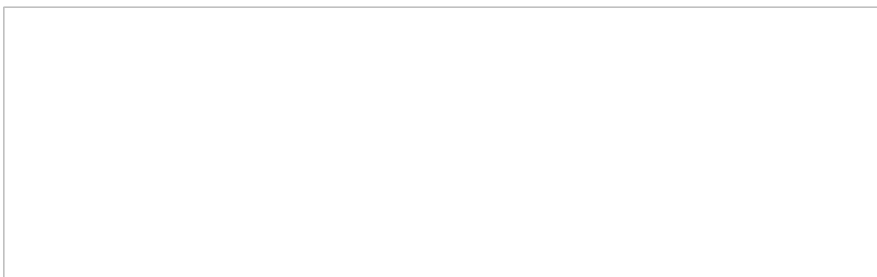
### iSight Camera

- 5MP photos
- Autofocus
- Face detection
- Backside illumination
- Five-element lens
- Hybrid IR filter
- *f*/2.4 aperture
- Tap to focus video or still images
- Tap to control exposure for video or still images
- Photo and video geotagging

### Video Recording

- 1080p HD video recording
- Video stabilization
- Face detection
- Tap to focus while recording
- Backside illumination

## External Buttons and Connectors



## External Buttons and Controls

# 662\_iPad (4th generation) - Technical Specifications.pdf

- Home
- On/Off; Sleep/Wake
- Silent/Screen rotation lock
- Volume up/down

## Connectors and Input/Output

- Microphone
- 3.5-mm stereo headphone minijack
- Lightning connector
- Built-in speaker

## Power and Battery <sup>5</sup>

### Wi-Fi

- Built-in 42.5-watt-hour rechargeable lithium-polymer battery
- Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
- Charging via power adapter or USB to computer system

### Wi-Fi + Cellular

- Built-in 42.5-watt-hour rechargeable lithium-polymer battery
- Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
- Up to 9 hours of surfing the web using cellular data network
- Charging via power adapter or USB to computer system

## Input/Output

### Wi-Fi

- Lightning connector
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Microphone

### Wi-Fi + Cellular

- Lightning connector
- 3.5-mm stereo headphone minijack
- Built-in speaker
- Microphone
- Micro-SIM card tray

## Sensors

- Three-axis gyro
- Accelerometer
- Ambient light sensor

## Location

### Wi-Fi

- Wi-Fi
- Digital compass

### Wi-Fi + Cellular

- Wi-Fi
- Digital compass
- Assisted GPS and GLONASS
- Cellular

## Audio Playback

- Frequency response: 20Hz to 20,000Hz

# 662\_iPad (4th generation) - Technical Specifications.pdf

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring to Apple TV (2nd and 3rd generation)
- Video mirroring and video out support: Up to 720p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 1080p, 30 frames per second, High Profile level 4.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- Viewable document types: .jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel)

## Languages

- Language support for English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- Keyboard support for English (U.S.), English (Australian), English (Canadian), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese (Portugal), Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Tibetan, Turkish, Ukrainian, Vietnamese
- Dictionary support (enables predictive text and autocorrect) for English (U.S.), English (Australian), English (Canadian), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese (Portugal), Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- Siri language support for English (U.S., UK, Canada, Australia), Spanish (U.S., Mexico, Spain), French (France, Canada, Switzerland), German (Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong)

## Accessibility

- VoiceOver screen reader
- Guided Access
- Support for playback of closed-captioned content
- AssistiveTouch interface for adaptive accessories
- Full-screen zoom magnification
- Large text
- Option to invert colors
- Left/right volume adjustment

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing

## System Requirements

- Apple ID (required for some features)
- Internet access <sup>6</sup>
- **Syncing with iTunes on a Mac or PC requires:**
  - Mac: OS X v10.6.8 or later

# 662\_iPad (4th generation) - Technical Specifications.pdf

- PC: Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 2 or later
- Download iTunes at [www.itunes.com/download](http://www.itunes.com/download)

## In the Box

- iPad with Retina display
- Lightning to USB Cable
- USB Power Adapter

## Built-in Apps

- Safari
- Photos
- App Store
- Maps
- Photo Booth
- Reminders
- Camera
- Mail
- FaceTime
- iTunes
- Music
- Clock
- Calendar
- Messages
- Newsstand
- Videos
- Game Center
- Contacts
- Notes

## iPad and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iPad embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:**

- Mercury-free LCD display
- Arsenic-free display glass
- BFR-free
- PVC-free
- Recyclable aluminum enclosure

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPad.

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\*To identify your iPad model number, see <http://support.apple.com/kb/HT5452>. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).

1. Actual size and weight vary by configuration and manufacturing process.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
4. FaceTime video calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
5. Testing conducted by Apple in October 2012 using preproduction iPad (4th generation) units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique songs, consisting of a combination of songs imported from CDs using iTunes (128-Kbps AAC encoding) and songs purchased from the iTunes Store (256-Kbps AAC encoding). Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and

## 662\_iPad (4th generation) - Technical Specifications.pdf

mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.

6. Wireless broadband recommended; fees may apply.

Published Date: Oct 14, 2016

# iTunes 11 for Mac - Technical Specifications

## Software:

- Mac OS X version 10.6.8 or later
- 400MB of available disk space
- iTunes in the Cloud and iTunes Match availability may vary by country.

## Hardware

- Mac computer with an Intel Core processor and 512MB of RAM
- To play 720p HD video, an iTunes LP, or iTunes Extras, a 2.0GHz Intel Core 2 Duo or faster processor and 1GB of RAM is required.
- To play 1080p HD video, a 2.4GHz Intel Core 2 Duo or faster processor and 2GB of RAM is required.
- Screen resolution of 1024x768 or greater; 1280x800 or greater is required to play an iTunes LP or iTunes Extras
- Broadband Internet connection to use the iTunes Store
- Apple combo drive or SuperDrive to create audio, MP3, or back-up CDs; some non-Apple CD-RW recorders may also work
- Apple SuperDrive to back up your library to DVDs; some non-Apple DVD-RW drives may also work

Published Date: Nov 29, 2012

# iTunes 11 for Windows - Technical Specifications

## Hardware

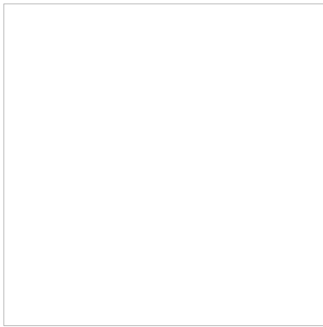
- PC with a 1GHz Intel or AMD processor and 512MB of RAM
- To play Standard Definition video from the iTunes Store, an Intel Pentium D or faster processor, 512MB of RAM, and a DirectX 9.0-compatible video card is required.
- To play 720p HD video, an iTunes LP, or iTunes Extras, a 2.0GHz Intel Core 2 Duo or faster processor, 1GB of RAM, and an Intel GMA X3000, ATI Radeon X1300, or NVIDIA GeForce 6150 or better is required.
- To play 1080p HD video, a 2.4GHz Intel Core 2 Duo or faster processor, 2GB of RAM, and an Intel GMA X4500HD; ATI Radeon HD 2400; Nvidia GeForce 8300 GS or better is required.
- Screen resolution of 1024x768 or greater; 1280x800 or greater is required to play an iTunes LP or iTunes Extras
- 16-bit sound card and speakers
- Broadband Internet connection to use the iTunes Store
- iTunes-compatible CD or DVD recorder to create audio CDs, MP3 CDs, or back-up CDs or DVDs

## Software

- Windows XP Service Pack 2 or later, 32-bit editions of Windows Vista, Windows 7, or Windows 8
- 64-bit editions of Windows Vista, Windows 7, or Windows 8 require the [iTunes 64-bit installer](#)
- 400MB of available disk space
- Screen reader support requires Window-Eyes 7.2 or later; for information about accessibility in iTunes, visit [www.apple.com/accessibility](http://www.apple.com/accessibility)

Published Date: Nov 29, 2012

# iMac (21.5-inch, Late 2012) - Technical Specifications



## Display

- 21.5-inch (diagonal) LED-backlit display with IPS technology
- 1920-by-1080 resolution with support for millions of colors

## Processor

- **2.7GHz**  
2.7GHz quad-core Intel Core i5 processor (Turbo Boost up to 3.2GHz) with 6MB L3 cache
- **2.9GHz**  
2.9GHz quad-core Intel Core i5 processor (Turbo Boost up to 3.6GHz) with 6MB L3 cache  
*Configurable to 3.1GHz quad-core Intel Core i7 (Turbo Boost up to 3.9GHz).*

## Memory

- 8GB (two 4GB) of 1600MHz DDR3 memory  
*Configurable to 16GB.*

## Storage

- **2.7GHz**  
1TB (5400-rpm) hard drive
- **2.9GHz**  
1TB (5400-rpm) hard drive  
*Configurable to 1TB Fusion Drive.*

## Graphics

- **2.7GHz**  
NVIDIA GeForce GT 640M graphics processor with 512MB of GDDR5 memory
- **2.9GHz**  
NVIDIA GeForce GT 650M graphics processor with 512MB of GDDR5 memory

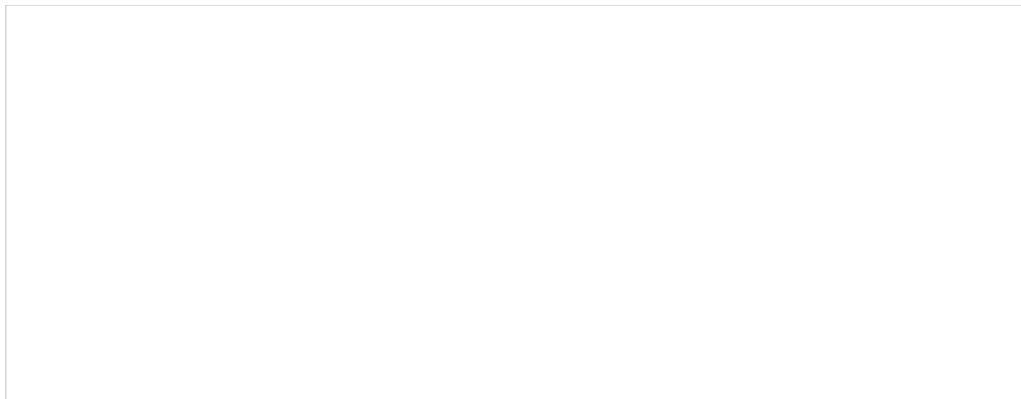
## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display
- Support for extended desktop and video mirroring modes

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone





## Connections and Expansion

- SDXC card slot
- Four USB 3 ports
- Two Thunderbolt ports
- Mini DisplayPort output with support for DVI, VGA, and dual-link DVI (adapters sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Input

- **Apple Wireless Keyboard**  
Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement)
- **Magic Mouse**  
Smooth, seamless Multi-Touch surface with support for simple gestures (scrolling and swiping). Click and double-click anywhere. Ambidextrous construction accommodates left- and right-handed users.
- **Magic Trackpad**  
Glass Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch and expand, swipe, three-finger swipe, four-finger swipe, tap, double-tap, rotate, screen zoom, scroll, click and drag, click drag and lock, secondary click A and B.

## Wireless

- **Wi-Fi**  
802.11n Wi-Fi wireless networking,<sup>2</sup> IEEE 802.11a/b/g compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Size and Weight

- *Height:* 17.7 inches (45.0 cm)
- *Width:* 20.8 inches (52.8 cm)
- *Stand depth:* 6.9 inches (17.5 cm)
- *Weight:* 12.5 pounds (5.68 kg)<sup>3</sup>

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet

## Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer’s purchase date. Only the [AppleCare Protection Plan](#) provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple- authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

# 665\_iMac (21.5-inch, Late 2012) - Technical Specifications.pdf

- iMac
- Apple Wireless Keyboard
- Apple Magic Mouse
- Power cord

## Included Software

- **OS X Mountain Lion:**  
The world's most advanced desktop operating system. [Learn more](#)
- Mac App Store
- Safari
- Mail
- Messages
- Calendar
- Contacts
- Reminders
- Notes
- Time Machine
- FaceTime
- Photo Booth
- Game Center
- iTunes
- **iLife:** iPhoto, iMovie, and GarageBand

## Configure to Order

- **21.5-inch iMac 2.7GHz**
  - Magic Trackpad
  - 16GB memory upgrade (two 8GB)
- **21.5-inch iMac 2.9GHz**
  - Magic Trackpad
  - 16GB memory upgrade (two 8GB)
  - 1 TB Fusion Drive
  - 3.1GHz quad-core Intel Core i7 (Turbo Boost up to 3.9GHz) with 8MB L3 cache

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact.

**iMac is designed with the following features to reduce its environmental impact:**

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>4</sup>
- Mercury-free LED-backlit display
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>5</sup>

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac.](#)

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Pro
- Final Cut Pro X

## Displays and Graphics

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

## AirPort and Wireless

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station

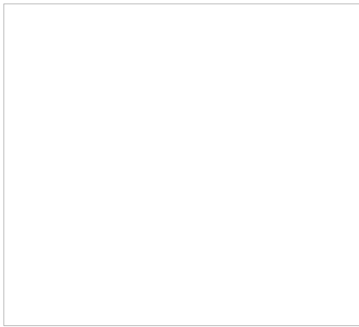
## Other Accessories

- Magic Trackpad
- Apple USB SuperDrive
- Apple Battery Charger
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. Weight varies by configuration and manufacturing process.
  4. PVC-free AC power cord available in all regions except South Korea.
  5. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 13, 2016

# iMac (27-inch, Late 2012) - Technical Specifications



## Display

- 27-inch (diagonal) LED-backlit display with IPS technology
- 2560-by-1440 resolution with support for millions of colors

## Processor

- **2.9GHz**  
2.9GHz quad-core Intel Core i5 processor (Turbo Boost up to 3.6GHz) with 6MB L3 cache
- **3.2GHz**  
3.2GHz quad-core Intel Core i5 processor (Turbo Boost up to 3.6GHz) with 6MB L3 cache  
*Configurable to 3.4GHz quad-core Intel Core i7 (Turbo Boost up to 3.9GHz).*

## Memory

- 8GB (two 4GB) of 1600MHz DDR3 memory; four user-accessible SO-DIMM slots  
*Configurable to 16GB or 32GB.*

## Storage

- 1TB (7200-rpm) hard drive  
*Configurable to 3TB hard drive, 1TB or 3TB Fusion Drive, or 768GB of flash storage.*

## Graphics

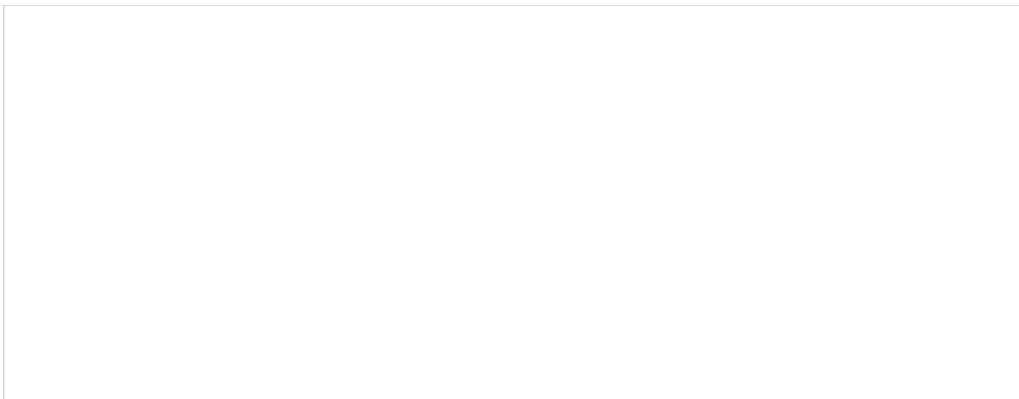
- **2.9GHz**  
NVIDIA GeForce GTX 660M graphics processor with 512MB of GDDR5 memory
- **3.2GHz**  
NVIDIA GeForce GTX 675MX graphics processor with 1GB of GDDR5 memory  
*Configurable to NVIDIA GeForce GTX 680MX with 2GB of GDDR5 memory.*

## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display
- Support for extended desktop and video mirroring modes

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone



## Connections and Expansion

- SDXC card slot
- Four USB 3 ports
- Two Thunderbolt ports
- Mini DisplayPort output with support for DVI, VGA, and dual-link DVI (adapters sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Input

### Apple Wireless Keyboard

Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement)

### Magic Mouse

Smooth, seamless Multi-Touch surface with support for simple gestures (scrolling and swiping). Click and double-click anywhere. Ambidextrous construction accommodates left- and right-handed users.

### Magic Trackpad

Glass Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch and expand, swipe, three-finger swipe, four-finger swipe, tap, double-tap, rotate, screen zoom, scroll, click and drag, click drag and lock, secondary click A and B.

## Wireless

- **Wi-Fi**  
802.11n Wi-Fi wireless networking,<sup>2</sup> IEEE 802.11a/b/g compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Size and Weight

- *Height:* 20.3 inches (51.6 cm)
- *Width:* 25.6 inches (65.0 cm)
- *Stand depth:* 8 inches (20.3 cm)
- *Weight:* 21 pounds (9.54 kg)<sup>3</sup>

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet

## Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer’s purchase date. Only the [AppleCare Protection Plan](#) provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple- authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

# 667\_iMac (27-inch, Late 2012) - Technical Specifications.pdf

- iMac
- Apple Wireless Keyboard
- Apple Magic Mouse
- Power cord

## Included Software

- **OS X Mountain Lion:**  
The world's most advanced desktop operating system. [Learn more](#)
- Mac App Store
- Safari
- Mail
- Messages
- Calendar
- Contacts
- Reminders
- Notes
- Time Machine
- FaceTime
- Photo Booth
- Game Center
- iTunes
- **iLife:** iPhoto, iMovie, and GarageBand

## Configure to Order

- 27-inch iMac 2.9GHz
  - Magic Trackpad
  - 16GB memory upgrade (two 8GB)
  - 32GB memory upgrade (four 8GB)
  - 3TB hard drive
  - 1TB or 3TB Fusion Drive
  - 768GB of flash storage
- 27-inch iMac 3.2GHz
  - Magic Trackpad
  - 16GB memory upgrade (two 8GB)
  - 32GB memory upgrade (four 8GB)
  - 3TB hard drive
  - 1TB or 3TB Fusion Drive
  - 768GB of flash storage
  - 3.4GHz quad-core Intel Core i7 (Turbo Boost up to 3.9GHz) with 8MB L3 cache
  - NVIDIA GeForce GTX 680MX graphics processor with 2GB of GDDR5 memory

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact.

**iMac is designed with the following features to reduce its environmental impact:**

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>4</sup>
- Mercury-free LED-backlit display
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>5</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac.](#)

**Acoustic Performance**

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	2.9 GHz	3.2 GHz	2.9 GHz	3.2 GHz
Idle	3.0	3.0	15	14
Hard drive accessing	3.1	3.0	15	15
CD drive accessing	N/A	N/A	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

**Accessories****Mac Software**

- *iWork*
- *Aperture*
- *Logic Pro*
- *Final Cut Pro X*

**Displays and Graphics**

- *Apple Mini DisplayPort to DVI Adapter*
- *Apple Mini DisplayPort to VGA Adapter*
- *Apple Mini DisplayPort to Dual-Link DVI Adapter*

**AirPort and Wireless**

- *Time Capsule*
- *AirPort Express Base Station*
- *AirPort Extreme Base Station*

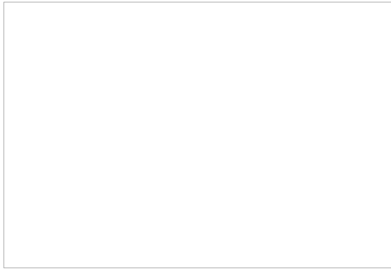
**Other Accessories**

- *Magic Trackpad*
- *Apple USB SuperDrive*
- *Apple Battery Charger*
- *AppleCare Protection Plan*

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. Weight varies by configuration and manufacturing process.
  4. PVC-free AC power cord available in all regions except South Korea.
  5. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 14, 2016

# MacBook Pro (Retina, 13-inch, Early 2013) - Technical Specifications



## Display

- Retina display: 13.3-inch (diagonal) LED-backlit display with IPS technology
- 2560-by-1600 native resolution at 227 pixels per inch with support for millions of colors
- Scaled resolutions: 1680 by 1050, 1440 by 900, and 1024 by 640 pixels

## Processor

- 2.5GHz dual-core  
Intel Core i5 processor (Turbo Boost up to 3.1GHz) with 3MB shared L3 cache  
*Configurable to 2.9GHz dual-core Intel Core i7 (Turbo Boost up to 3.6GHz) with 4MB shared L3 cache.*
- 2.6GHz dual-core  
Intel Core i5 processor (Turbo Boost up to 3.2GHz) with 3MB shared L3 cache  
*Configurable to 3.0GHz dual-core Intel Core i7 (Turbo Boost up to 3.7GHz) with 4MB shared L3 cache.*

## Memory

8GB of 1600MHz DDR3L onboard memory

## Storage<sup>1</sup>

- 2.5GHz dual-core  
128GB  
*Configurable to 256GB, 512GB, or 768GB flash storage.*
- 2.6GHz dual-core  
256GB  
*Configurable to 512GB or 768GB flash storage.*

## Size and Weight

- Height: 0.75 inch (1.9 cm)
- Width: 12.35 inches (31.4 cm)
- Depth: 8.62 inches (21.9 cm)
- Weight: 3.57 pounds (1.62 kg)<sup>2</sup>

## Graphics and Video Support

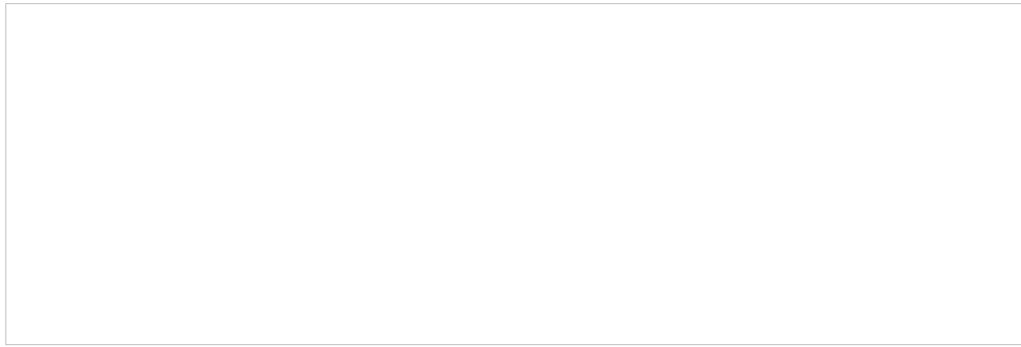
- Intel HD Graphics 4000
- Dual display and video mirroring:  
Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on up to two external displays, at millions of colors
- **Thunderbolt digital video output**
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)

## Camera

720p FaceTime HD camera



## Connections and Expansion



- MagSafe 2 power port
- Two Thunderbolt ports (up to 10 Gbps)
- Two USB 3 ports (up to 5 Gbps)
- HDMI port
- Headphone port
- SDXC card slot
- Apple Thunderbolt to FireWire Adapter (sold separately)
- Apple Thunderbolt to Gigabit Ethernet Adapter (sold separately)

## Wireless

- **Wi-Fi**  
802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 7 hours wireless web
- Up to 30 days standby time
- Built-in 74-watt-hour lithium-polymer battery
- 60W MagSafe 2 Power Adapter with cable management system; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 113° F (–24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Included Software

- **OS X Mountain Lion:**

The world's most advanced desktop operating system. [Learn more](#)

- Mac App Store
- Safari
- Mail
- Messages
- Calendar
- Contacts
- Reminders
- Notes
- Time Machine
- FaceTime
- Photo Booth
- Game Center
- iTunes
- **iLife:** iPhoto, iMovie, and GarageBand.

## Limited Warranty and Service

Your MacBook Pro with Retina display comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Pro with Retina display
- MagSafe 2 Power Adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Pro to order with these options, only at the [Apple Online Store](#):

- 2.9GHz dual-core Intel Core i7 with Turbo Boost up to 3.6GHz and 4MB shared L3 cache
- 3.0GHz dual-core Intel Core i7 with Turbo Boost up to 3.7GHz and 4MB shared L3 cache
- 256GB, 512GB, or 768GB of flash storage

## MacBook Pro with Retina Display and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**MacBook Pro with Retina display is designed with the following features to reduce its environmental impact:**

- Highly recyclable aluminum enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>6</sup>
- Packaging volumes reduced by 25 percent for up to a 45 percent reduction in aircraft usage.

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Idle	2.5	6.0
Hard drive accessing	N/A	N/A
CD drive accessing	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

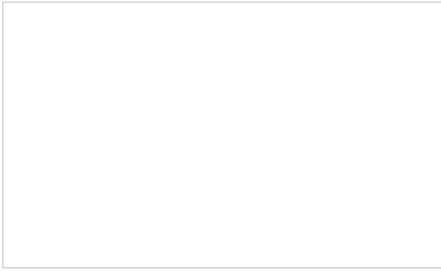
## Accessories

- **Mac Software**
  - iWork
  - Aperture
  - Logic Pro
  - Final Cut Pro X
- **Displays and Adapters**
  - Apple Thunderbolt Display
  - Apple Mini DisplayPort to DVI Adapter
  - Apple Mini DisplayPort to VGA Adapter
  - Apple Mini DisplayPort to Dual-Link DVI Adapter
  - MagSafe to MagSafe 2 Converter
- **AirPort and Wireless**
  - AirPort Express Base Station
  - AirPort Extreme Base Station
  - Time Capsule
- **Other Accessories**
  - Apple USB SuperDrive
  - Thunderbolt to Gigabit Ethernet Adapter
  - Thunderbolt to FireWire Adapter
  - 60W MagSafe 2 Power Adapter
  - 85W MagSafe 2 Power Adapter
  - AppleCare Protection Plan

- 
1. 1GB=1 billion bytes; actual formatted capacity less.
  2. Actual weight varies by configuration and manufacturing process.
  3. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  4. Wireless web testing conducted by Apple in January 2013 using preproduction 2.7GHz quad-core Intel Core i7-based 15-inch MacBook Pro systems and preproduction 2.6GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Standby testing conducted by Apple in May 2012 using preproduction 2.6GHz quad-core Intel Core i7-based 15-inch MacBook Pro systems and in September 2012 using preproduction 2.5GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems. The standby test measures battery life by allowing a system, connected to a wireless network, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. PVC-free AC power cord available in all regions except China and South Korea.
  6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 14, 2016

# MacBook Pro (Retina, 15-inch, Early 2013) - Technical Specifications



## Display

- Retina display: 15.4-inch (diagonal) LED-backlit display with IPS technology
- 2880-by-1800 native resolution at 220 pixels per inch with support for millions of colors
- Scaled resolutions: 1920 by 1200, 1680 by 1050, 1280 by 800, and 1024 by 640 pixels

## Processor

- 2.4GHz quad-core  
Intel Core i7 processor (Turbo Boost up to 3.4GHz) with 6MB shared L3 cache  
*Configurable to 2.7GHz quad-core Intel Core i7 (Turbo Boost up to 3.7GHz) with 6MB shared L3 cache or 2.8GHz quad-core Intel Core i7 (Turbo Boost up to 3.8GHz) with 8MB shared L3 cache.*
- 2.7GHz quad-core  
Intel Core i7 processor (Turbo Boost up to 3.7GHz) with 6MB shared L3 cache  
*Configurable to 2.8GHz quad-core Intel Core i7 (Turbo Boost up to 3.8GHz) with 8MB shared L3 cache.*

## Memory

- 2.4GHz quad-core  
8GB of 1600MHz DDR3L onboard memory  
*Configurable to 16GB.*
- 2.7GHz quad-core  
16GB of 1600MHz DDR3L onboard memory

## Storage<sup>1</sup>

- 2.4GHz quad-core  
256GB  
*Configurable to 512GB or 768GB flash storage.*
- 2.7GHz quad-core  
512GB  
*Configurable to 768GB flash storage.*

## Size and Weight

- Height: 0.71 inch (1.8 cm)
- Width: 14.13 inches (35.89 cm)
- Depth: 9.73 inches (24.71 cm)
- Weight: 4.46 pounds (2.02 kg)<sup>2</sup>

## Graphics and Video Support

- Intel HD Graphics 4000
- NVIDIA GeForce GT 650M with 1GB of GDDR5 memory and automatic graphics switching
- Dual display and video mirroring:  
Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on up to two external displays, at millions of colors
- **Thunderbolt digital video output**
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)

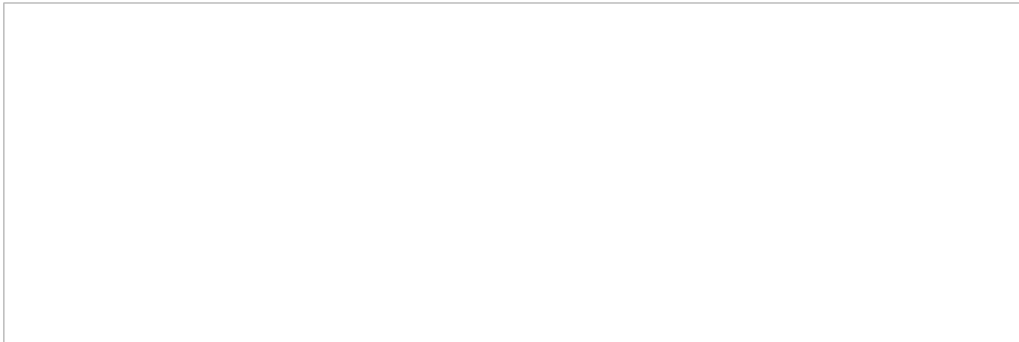
# 669\_MacBook Pro (Retina, 15-inch, Early 2013) - Technical Specifications.pdf

- VGA output using Mini DisplayPort to VGA Adapter (sold separately)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)

## Camera

720p FaceTime HD camera

## Connections and Expansion



- MagSafe 2 power port
- Two Thunderbolt ports (up to 10 Gbps)
- Two USB 3 ports (up to 5 Gbps)
- HDMI port
- Headphone port
- SDXC card slot
- Apple Thunderbolt to FireWire Adapter (sold separately)
- Apple Thunderbolt to Gigabit Ethernet Adapter (sold separately)

## Wireless

- **Wi-Fi**  
802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 7 hours wireless web
- Up to 30 days standby time
- Built-in 95-watt-hour lithium-polymer battery
- 85W MagSafe 2 Power Adapter with cable management system; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 113° F (–24° to 45° C)

- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Included Software

- **OS X Mountain Lion:**  
The world's most advanced desktop operating system. [Learn more](#)
- Mac App Store
- Safari
- Mail
- Messages
- Calendar
- Contacts
- Reminders
- Notes
- Time Machine
- FaceTime
- Photo Booth
- Game Center
- iTunes
- **iLife:** iPhoto, iMovie, and GarageBand.

## Limited Warranty and Service

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## In the Box

- MacBook Pro with Retina display
- MagSafe 2 Power Adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Pro to order with these options, only at the [Apple Online Store](#):

- 2.7GHz quad-core Intel Core i7 with Turbo Boost up to 3.7GHz and 6MB shared L3 cache
- 2.8GHz quad-core Intel Core i7 with Turbo Boost up to 3.8GHz and 8MB shared L3 cache
- 16GB memory
- 512GB or 768GB of flash storage

## MacBook Pro with Retina Display and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**MacBook Pro with Retina display is designed with the following features to reduce its environmental impact:**

- Highly recyclable aluminum enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>6</sup>
- Packaging volumes reduced by 25 percent for up to a 45 percent reduction in aircraft usage.

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

**Recycling**

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

**Acoustic Performance**

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	2.4 GHz	2.7 GHz	2.4 GHz	2.7 GHz
Idle	2.5	2.5	8.0	8.0
Hard drive accessing	N/A	N/A	N/A	N/A
CD drive accessing	N/A	N/A	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

**Accessories**

- **Mac Software**
  - iWork
  - Aperture
  - Logic Pro
  - Final Cut Pro X
- **Displays and Adapters**
  - Apple Thunderbolt Display
  - Apple Mini DisplayPort to DVI Adapter
  - Apple Mini DisplayPort to VGA Adapter
  - Apple Mini DisplayPort to Dual-Link DVI Adapter
  - MagSafe to MagSafe 2 Converter
- **AirPort and Wireless**
  - AirPort Express Base Station
  - AirPort Extreme Base Station
  - Time Capsule
- **Other Accessories**
  - Apple USB SuperDrive
  - Thunderbolt to Gigabit Ethernet Adapter
  - Thunderbolt to FireWire Adapter
  - 60W MagSafe 2 Power Adapter
  - 85W MagSafe 2 Power Adapter
  - AppleCare Protection Plan

- 
1. 1GB=1 billion bytes; actual formatted capacity less.
  2. Actual weight varies by configuration and manufacturing process.
  3. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  4. Wireless web testing conducted by Apple in January 2013 using preproduction 2.7GHz quad-core Intel Core i7-based 15-inch MacBook Pro systems and preproduction 2.6GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Standby testing conducted by Apple in May 2012 using preproduction 2.6GHz quad-core Intel Core i7-based 15-inch MacBook Pro systems and in September 2012 using preproduction 2.5GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems. The standby test measures battery life by allowing a system, connected to a wireless network, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. PVC-free AC power cord available in all regions except China and South Korea.
  6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 14, 2016

# iPod photo (40 GB, 60 GB) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iPod photo (40 GB, 60 GB) - Technical Specifications

Configurations (Mac + PC)	40GB iPod	60GB iPod
Model	M9585LL/A	M9586LL/A
Storage	40GB <sup>(1)</sup>	60GB <sup>(1)</sup>
Battery life	Up to 15 hours audio playback time <sup>(3)</sup> Up to 5 hours slideshow playback time (without video out) <sup>(3)</sup>	
Skip protection	Up to 25 minutes	
Display	2-inch (diagonal) color LCD with LED backlight	
Ports	Dock connector, remote connector, stereo minijack	
Connectivity	FireWire 400 and USB 2.0 through dock connector	
Charge time	Up to 5 hours (up to 3-hour fast charge to 80% capacity)	
Audio support	AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible, AIFF, Apple Lossless and WAV	
Size	4.1 by 2.4 by 0.75 inches	
Weight	6.4 ounces	
Included software	iTunes for Mac, iTunes for Windows <sup>(4)</sup>	
Included accessories	Earbud headphones, iPod Power Adapter, Dock Connector to FireWire cable, Dock Connector to USB 2.0 cable, iPod photo AV cable, carrying case, Dock	
Optional accessories	Dock; in-ear headphones; earbud headphones and remote; carrying case; AC adapter; Dock Connector to USB 2.0 cable; Dock Connector to FireWire cable; world travel adapter kit	
Mac requirements	Macintosh computer with FireWire port or built-in USB 2.0 port; Mac OS X v10.2.8 or later (for FireWire); USB 2.0 requires Mac OS X v10.3.4 or later	
Windows requirements	PC with FireWire or USB 2.0 port, or FireWire or USB 2.0 card; Windows 2000 (Service Pack 4 or later) or Windows XP Home or Professional (Service Pack 2 or later)	
Documentation and support	Electronic documentation and getting started guide.	
Limited warranty and service	Your iPod comes with single incident telephone support for the first 90 days and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> for iPod to extend your service and support to two full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	

Options & Accessories	Available from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Cables and adapters	Dock Connector to FireWire Cable M9127G/A iPod Dock Connector to USB 2.0 Cable M9569G/A Apple iPod AV Cable (M9765G/A)
Docks & Kits	iPod photo Dock Kit (M9868G/A) Apple iPod Universal Dock (MA045G/A) iPod AV Connection Kit (MA242LL/A)
Headphones	Remote & Earbud Headphones M9128G/A In-Ear Headphones M9394G/A
Cases	Carrying Case w/ Belt Clip
Services	AppleCare Protection Plan M9404LL/A

### Technical Specifications



<b>Capacity</b> <ul style="list-style-type: none"><li>40 GB or 60 GB hard disk drive<sup>(1)</sup><ul style="list-style-type: none"><li>Holds 10,000 or 15,000 songs in 128-Kbps AAC format<sup>(2)</sup></li><li>Stores data via FireWire or USB 2.0<sup>(3)</sup> hard drive</li></ul></li></ul> <b>Size and weight (40 GB and 60 GB models)</b> <ul style="list-style-type: none"><li>Height: 4.1 in</li><li>Width: 2.4 in</li><li>Depth: 0.75 in</li><li>Weight: 6.4 oz (181 g)</li></ul> <b>Display (40 GB and 60 GB models)</b> <ul style="list-style-type: none"><li>2-inch (diagonal) color liquid crystal display with blue-white LED backlight</li><li>220-by-176-pixel resolution, 0.18-mm dot pitch</li><li>16-bit, 65,536 colors</li><li>Support for display of multiple languages and characters simultaneously</li><li>Syncs iPod-viewable photos in JPEG, BMP, GIF, TIFF, PSD (Mac only) and PNG formats.</li></ul> <b>Audio</b> <ul style="list-style-type: none"><li>Up to 25 minutes of skip protection</li><li>Frequency response: 20Hz to 20,000Hz</li><li>Audio formats supported: AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible, AIFF, Apple Lossless and WAV</li><li>Upgradable firmware enables support for future audio formats</li></ul>	<b>Customizable settings (iPod)</b> <ul style="list-style-type: none"><li>Customize main menu</li><li>Create multiple On-The-Go playlists</li><li>Adjust audiobook playback speed</li><li>Clicker playback through headphones</li><li>Rate songs</li><li>Shuffle songs or albums</li><li>Repeat one or all</li><li>Sound Check on or off</li><li>20 Equalizer settings</li><li>Backlight timer</li><li>Display contrast</li><li>Alarms on, off or silent</li><li>Sleep timer</li><li>Date and time</li><li>Display time in menu bar</li><li>Contacts sort and display by first or last names</li><li>Clicker on or off</li><li>Menu Languages: English, French, German, Japanese, Spanish, Italian, Dutch, Danish, Norwegian, Finnish, Swedish, Korean, Simplified Chinese, Traditional Chinese.</li><li>Display Song, Artist and Album Info in: Bulgarian, Croatian, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Slovenian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, Turkish and Ukrainian.</li></ul>	<b>Headphones</b> <ul style="list-style-type: none"><li>Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets</li><li>Frequency response: 20Hz to 20,000Hz</li><li>Impedance: 32 ohms</li></ul> <b>Input and output</b> <ul style="list-style-type: none"><li>Dock connector</li><li>3.5-mm stereo headphone jack</li><li>Wired remote connector</li></ul> <b>Environmental requirements</b> <ul style="list-style-type: none"><li>Operating temperature: 32° to 95° F (0° to 35° C)</li><li>Non operating temperature: -4° to 113° F (-20° to 45° C)</li><li>Relative humidity: 5% to 95% noncondensing</li><li>Maximum operating altitude: 10,000 feet (3000 m)</li></ul> <b>Power and battery</b> <sup>(3)</sup> <ul style="list-style-type: none"><li>Built-in rechargeable lithium ion battery</li><li>iPod audio playback time: Up to 15 hours when fully charged</li><li>iPod slideshow playback time: Up to 5 hours when fully charged (without TV out)</li><li>Standby time: 1 month when fully charged</li><li>Charging via FireWire to computer system or power adapter<ul style="list-style-type: none"><li>Fast-charge time: Up to 3 hours for iPod (charges up to 80% of battery capacity)</li><li>Full-charge time: Up to 5 hours</li></ul></li><li>Charging via USB 2.0 to computer system or optional power adapter<ul style="list-style-type: none"><li>Full-charge time: Up to 5 hours</li></ul></li></ul> <b>Power adapter</b> <ul style="list-style-type: none"><li>iPod Power Adapter</li><li>AC input: 100V to 240V at 0.4 amp maximum</li><li>Frequency: 50Hz to 60Hz</li><li>DC output: 5V at 1 amp maximum</li></ul>
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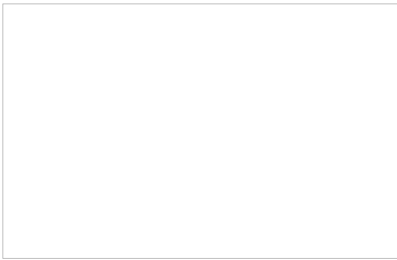
1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Capacity based on 4 minutes per song and 128-Kbps AAC encoding.

3. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

4. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

# MacBook Air (13-inch, Mid 2012) - Technical Specifications



## Display

- 13.3-inch (diagonal) high-resolution LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions:  
1440 x 900 (native), 1280 x 800, 1152 x 720, and 1024 x 640 at 16:10 ratio and 1024 x 768 and 800 x 600 at 4:3 ratio.

## Storage<sup>1</sup>

- 128GB flash storage
- 256GB flash storage  
*Configurable to 512GB flash storage.*

## Processor

1.8GHz dual-core Intel Core i5 (Turbo Boost up to 2.8GHz) with 3MB shared L3 cache

## Memory

4GB of 1600MHz DDR3L onboard memory  
*Configurable to 8GB.*

## Size and Weight

- *Height:* 0.11-0.68 inch (0.3-1.7 cm)
- *Width:* 12.8 inches (32.5 cm)
- *Depth:* 8.94 inches (22.7 cm)
- *Weight:* 2.96 pounds (1.35 kg)<sup>2</sup>

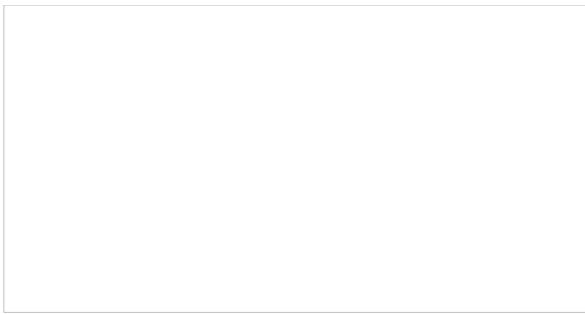
## Graphics and Video Support

- Intel HD Graphics 4000
- Dual display and video mirroring:  
Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- **Thunderbolt digital video output**
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
  - HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

## Camera

720p FaceTime HD camera

## Connections and Expansion



- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt port (up to 10 Gbps)
- MagSafe 2 power port
- SD card slot

## Wireless

- 802.11n Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g compatible
- Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Omnidirectional microphone
- Headphone port
- Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 7 hours wireless web
- Up to 30 days standby time
- Built-in 50-watt-hour lithium-polymer battery
- 45W MagSafe 2 Power Adapter with cable management; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Included Software

- **OS X Mountain Lion**  
Includes Mail, Messages, Contacts, Calendar, Safari, Reminders, Notification Center, Notes, Dictation, iCloud, Time Machine, FaceTime, Photo Booth, AirPlay, Game Center, the Mac App Store, iTunes, Gatekeeper, Twitter and Facebook integration,<sup>5</sup> and more. [Learn more about OS X Mountain Lion](#)
- **iLife**  
Includes iPhoto, iMovie, and GarageBand.

## Limited Warranty and Service

Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to

# 670\_MacBook Air (13-inch, Mid 2012) - Technical Specifications.pdf

extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Air
- 45W MagSafe 2 Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

## Configure to Order

Configure your MacBook Air to order with these options, only at the Apple Online Store:

- 2.0GHz dual-core Intel Core i7 (Turbo Boost up to 3.2GHz)
- 8GB memory upgrade
- 512GB of flash storage

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact.

**MacBook Air is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>6</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>7</sup>

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac.](#)

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Idle	2,5	6
Hard drive accessing	N/A	N/A
CD drive accessing	N/A	N/A

## Available Accessories

- **Mac Software**
  - iWork
  - Aperture
  - Logic Pro
  - Final Cut Pro X
- **Displays and Adapters**
  - Apple Thunderbolt Display
  - Apple Mini DisplayPort to DVI Adapter
  - Apple Mini DisplayPort to VGA Adapter
  - Apple Mini DisplayPort to Dual-Link DVI Adapter
  - MagSafe to MagSafe 2 Converter
- **AirPort and Wireless**
  - AirPort Extreme Base Station
  - AirPort Express Base Station
  - Time Capsule

# 670\_MacBook Air (13-inch, Mid 2012) - Technical Specifications.pdf

- Apple Wireless Keyboard
  - Apple Magic Mouse
  - Apple Magic Trackpad
  - **Other Accessories**
    - Apple USB SuperDrive
    - Thunderbolt to Gigabit Ethernet Adapter
    - Thunderbolt to FireWire Adapter
    - AppleCare Protection Plan
    - Apple USB Ethernet Adapter
- 

1. 1GB=1 billion bytes; actual formatted capacity less.
2. Actual weight varies by configuration and manufacturing process.
3. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
4. Testing conducted by Apple in May 2012 using preproduction 1.8GHz dual-core Intel Core i5–based 13-inch MacBook Air units and preproduction 1.7GHz dual-core Intel Core i5–based 11-inch MacBook Air units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. The standby test measures battery life by allowing a system, connected to a wireless network, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
5. Facebook integration coming this fall.
6. PVC-free AC power cord available in all regions except China and South Korea.
7. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Aug 29, 2017

# AirPort Extreme 802.11n (2nd Generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight<sup>1</sup>

- Length: 6.5 inches (165 mm)
- Width: 6.5 inches (165 mm)
- Height: 1.3 inches (34 mm)
- Weight: 1.66 pounds (753 grams)

## Wireless protocols

- 802.11a/b/g
- Draft 802.11n<sup>2</sup>

## Frequency bands

- 2.4GHz or 5GHz

## Radio output power

- 20 dBm (nominal)

## Compatibility

- AirPort Extreme is Wi-Fi certified for 802.11n draft 2.0 (Firmware version 7.2.1)
- Interoperable with Wi-Fi Certified 802.11a, 802.11b, and 802.11g Mac computers and Windows-based PCs
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP

## Included software and accessories

- AirPort Utility for Mac and Windows
- AirPort Disk Utility for Mac and Windows
- 802.11n Enabler for Mac
- Bonjour for Windows
- Power cord
- Printed and electronic documentation

## Security

- Wi-Fi Protected Access (WPA/WPA2)<sup>3</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Interfaces

- One Gigabit Ethernet WAN port for connecting a DSL or cable modem
- Three Gigabit Ethernet LAN ports for connecting computers or network devices
- USB port for connecting a USB printer or USB external hard drive
- 802.11n wireless

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity (operational): 20% to 80%
- Relative humidity (storage): 10% to 90%
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Agency approvals

# 671\_AirPort Extreme 802.11n (2nd Generation) - Technical Specifications.pdf

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268: 2003, UL 60950, CSA-C22.2 No. 60950

## Channels

- Channels 1-11, 36-48, and 149-165 approved for use in the United States and Canada.
- Channels 1-14, 36-64 approved for use in Japan
- Channels 1-13, 36-140 approved for use in Europe
- Channels 1-13, 36-64 approved for use in Australia, Hong Kong and New Zealand

## Electrical

- 12Vdc, 1.8A

System Requirements	For Macintosh Users	For PC Users
<b>For setup and administration</b>	<ul style="list-style-type: none"><li>• Mac with Ethernet or wireless networking capability</li><li>• Mac OS X v10.4.8 or later</li></ul>	<ul style="list-style-type: none"><li>• PC with Ethernet or wireless networking capability</li><li>• Windows XP with SP2 or later</li></ul>
<b>For wireless client access</b>	Mac with AirPort or AirPort Extreme wireless capability	PC with 802.11a, 802.11b, or 802.11g card
<b>For shared printing with a USB printer</b>	Mac with Mac OS X v10.2.7 or later	PC with Windows XP; Bonjour for Windows included on AirPort Extreme CD
<b>For AirPort Disk with a USB hard drive</b>	Mac with Mac OS X v10.4.8 or later	PC with Windows XP; Bonjour for Windows included on AirPort Extreme CD
<b>Extended Service and Support</b>	The AppleCare Protection Plan for your computer covers the AirPort Extreme Base Station.	

1. Weight varies by configuration and manufacturing process.
2. The AirPort Extreme Base Station is based on an IEEE 802.11n draft specification and is compatible with IEEE 802.11a, IEEE 802.11b, and IEEE 802.11g.
3. Support for Wi-Fi Protected Access (WPA/WPA2) requires Mac OS X v10.3 or later or Windows XP with SP2 or later.

Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort Extreme.

Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

# AirPort Extreme 802.11n (4th Generation) - Technical Specifications

## Size and weight

- Length: 6.5 inches (165 mm)
- Width: 6.5 inches (165 mm)
- Height: 1.3 inches (34 mm)
- Weight: 1.66 pounds (753 grams)<sup>1</sup>

## Wireless protocols

- IEEE 802.11a/b/g/n

## Frequency bands

- 2.4GHz and 5GHz simultaneously

## Radio output power

- 20 dBm (nominal)

## Compatibility

- Interoperable with Wi-Fi Certified 802.11a, 802.11b, 802.11g, or 802.11n enabled Mac computers, iPad, iPhone, iPod touch, and Windows-based PCs
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP, IPv6 (6to4 and manual tunnels)

## Included in the box

- AirPort Extreme Base Station
- Power supply with cord
- Printed documentation

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>2</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Interfaces

- One Gigabit Ethernet WAN port for connecting a DSL or cable modem
- Three Gigabit Ethernet LAN ports for connecting computers or network devices
- USB 2.0 port for connecting a USB printer or USB external hard drive
- 802.11n wireless

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity (operational): 20% to 80%
- Relative humidity (storage): 10% to 90%
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268: 2003, UL 60950, CSA-C22.2 No. 60950

## Channels



# 672\_AirPort Extreme 802.11n (4th Generation) - Technical Specifications.pdf

- Channels 1-11, 36-48, and 149-165 approved for use in the United States and Canada
- Channels 1-13, 36-64, and 100-140 approved for use in Japan
- Channels 1-13, 36-64, 100-112, and 132-140 approved for use in Europe
- Channels 1-13, 36-64, and 149-165 approved for use in Australia, Hong Kong, and New Zealand

## Electrical

- 12Vdc, 1.8A

## System Requirements

	For Mac Users	For PC Users
For setup and administration	Mac with Mac OS X 10.5.7 or later	PC with Windows XP (SP3), Windows Vista (SP2), or Windows 7 (SP1)
For wireless client access	Mac with AirPort wireless capability	PC with Wi-Fi Certified 802.11a/b/g/n card
For shared printing with a USB printer	<ul style="list-style-type: none"><li>• USB printer</li><li>• Mac with Mac OS X v10.2.7 or later</li></ul>	<ul style="list-style-type: none"><li>• USB printer</li><li>• PC with Windows XP (SP3), Windows Vista (SP2), or Windows 7 (SP1)</li></ul>
For AirPort Disk with a USB hard drive	Mac with Mac OS X v10.4.8 or later	PC with Windows XP (SP3), Windows Vista (SP2) or Windows 7 (SP1)

## Extended service and support

The [AppleCare Protection Plan](#) for your computer covers the AirPort Extreme Base Station.

- 
1. Weight varies by configuration and manufacturing process.
  2. Support for Wi-Fi Protected Access (WPA/WPA2) requires Mac OS X v10.3 or later or Windows XP with SP2 or later.

Wi-Fi Protected Access is a mark of the Wi-Fi Alliance. Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Product specifications are subject to change without notice.

Published Date: Mar 6, 2013

# Logic Pro 9 - Technical Specifications

## Minimum System Requirements

- 2GB of RAM (4GB recommended).
- Display with 1280-by-768 resolution or higher.
- OS X v10.6.8 or later.
- Minimum 6GB of disk space. (19GB of optional content available via in-app download).

## Main Windows

- Arrange window consolidates 16 edit and browser areas, including all the tracks and regions of a project.
- Mixer window shows all mixer channel strips, along with hosting instrument and effect plug-ins.
- Sample Editor window for audio file editing.
- Piano Roll window for piano roll-style editing of MIDI note and controller events.
- Score window to edit and print MIDI note events in musical notation.
- Hyper Editor window for “value bar” editing of MIDI events.
- Event List window for numerical editing of regions or MIDI events.
- Marker List window to edit text markers.
- Tempo List window to edit tempo events.
- Signature List window to edit time and key signatures.
- Bin window to manage the audio files and regions of a project.
- Loops browser area to find and preview Apple Loops based on tempo, key, style, and mood.
- Library browser area to find channel strips, plug-in settings, or external MIDI destinations.
- File browser area to find content on hard disk volumes and to import track data from other projects.
- Project Note and Track Note areas for text memos.
- Environment window for advanced routing and real-time processing of MIDI events.

## General

- 1220 definable key and MIDI commands.
- 90 recallable screen configurations.
- 200-step undo history.
- Full plug-in latency compensation, also for external audio and MIDI gear.
- Low latency mode can remove latency induced by plug-ins during recording.

## Audio

- Audio file and I/O resolution up to 24-bit/192kHz.
- Maximum project length greater than 6 hours at 96kHz; 13 hours at 44.1kHz.
- Trim tool for advanced timeline trimming functions.
- 87 effect plug-ins including Pedalboard, which has 30 different stompboxes.
- 40 software instrument plug-ins (24 from GarageBand, 16 from Logic Pro).
- 102 software instrument tuning tables, including equal-tempered, custom, and Hermode tuning.
- Flex Time editing using one of six different flex modes:
  - Slicing
  - Rhythmic
  - Monophonic
  - Polyphonic
  - Tempophone
  - Speed
- High-end dithering algorithms (POW-r, UV22HR).
- Full support for Apple Loops.
- Freeze Tracks releases CPU resources by invisibly rendering tracks.
- Sample-accurate audio editing in the Arrange window.
- Nondestructive graphical audio fades and crossfades for level or speed.

## MIDI

- 1/3840 note resolution.
- Real-time MIDI recording and notation.
- Fast and intuitive region looping.
- Global chord track with automatic chord recognition.
- Complete music notation:
  - Real-time transcription
  - Instrument transposition

# 673\_Logic Pro 9 - Technical Specifications.pdf

- Guitar tablature
- Drum notation
- Chord symbols
- Adaptive lyric input
- Automatic multibar rests
- Comprehensive palette of slurs, crescendos, and other ornaments
- Staff Styles for easy recall of multiple stave attributes
- Score Sets allow instruments to be combined for editing and print
- Layout and printing of complete professional scores
- Caps Lock Keyboard for real-time note entry using computer keyboard.
- MIDI step entry.
- Transform window for advanced editing of MIDI events.

## Editing

- Intuitive region-based editing.
- Powerful folders facilitate organization and streamline arranging tasks.
- Comprehensive set of editing tools assignable to left, right, and key-modified mouse buttons.
- Easy take management:
  - Colorize takes automatically or manually
  - Single-click take selection
  - Cut, trim, move, or rearrange takes
  - Move and edit entire take folders as you would any other region
- Quick Swipe Comping for audio:
  - Build a comp of parts from multiple takes
  - Create comps on the fly
  - Automatic, customizable crossfades between phrases
  - Flatten function replaces take folder with regions representing the current comp
  - Flatten and Merge function replaces take folder with newly created audio file
- Nondestructive MIDI and audio quantization:
  - Groove templates definable from MIDI or audio regions
  - 34 basic quantization settings
  - Six advanced quantization parameters
- Drum replacement or doubling to enhance recorded drum tracks with sampled drum sounds.
- Convert audio regions to a sampler instrument MIDI track.
- MIDI note extraction from audio for melodic transcription.
- Graphic beat mapping for creating tempo maps from existing audio or MIDI.
- Snap-to-transient selection.
- Definable relative or absolute snap grid.
- Shuffle Left and Right modes keep regions together while you're editing.
- Auto-crossfade mode inserts crossfades between regions automatically.
- Destructive sample editing using built-in or external sample editor.

## Mixer

- Up to 255 audio channel strips.
- Up to 255 software instrument channel strips.
- Up to 255 auxiliary channel strips.
- 64 busses.
- Each of the above in mono, stereo, or surround (with 1-8 audio channels).
- 15 inserts for internal or Audio Units effect plug-ins.
- 8 sends per channel strip, pre- or post-fader, or post-pan.
- Dynamic channel strip creation simplifies and accelerates mixer setup and configuration.
- Various view options simplify channel strip navigation:
  - “Single” for the selected track with all routing and send destinations
  - “Arrange” for all Arrange tracks (with or without destinations)
  - “All” for a complete overview
- Easy setup of multi-output software instruments.
- Save/Load complete plug-in configurations using channel strip settings.
- In-Place-Solo system with solo safe mode for any channel strip.
- Direct insert patching of external hardware instruments and effects with latency compensation.
- Busses as sources for recording.
- Inline input monitoring for audio channel strips.

## Grouping

# 673\_Logic Pro 9 - Technical Specifications.pdf

- 32 groups for audio, software instrument, or MIDI channel strips.
- Each channel strip can be part of multiple groups.
- Group settings for each group:
  - Editing (Selection), Phase-Locked Audio
  - Automation Mode
  - Volume, Pan, Mute, Solo
  - Input Monitoring, Record Enable
  - Send Levels 1 to 8
  - Color, Vertical Zoom, Hide
- Group clutch to temporarily disable all groups.
- Individual On/Off and Track Hide.

## Control Surface Support

- EuCon protocol support for Euphonix control surface systems.
- Support for Smart AV: Smart Console.
- Extensive support via control surface plug-ins:
  - Altech Systems / CM Automation: Motor Mix
  - Apogee Electronics: GiO
  - Frontier Design Group: TranzPort
  - JL Cooper: CS-32, FaderMaster 4/100, MCS3
  - Korg: Kontrol49, microKontrol
  - M-Audio: iControl
  - Mackie Designs: Baby HUI, HUI, Logic Control, XT, Mackie Control, C4, Extender
  - Radikal Technologies: SAC-2K
  - Roland: SI-24
  - Tascam: FE-8, FW-1082, FW-1884, US-224, US-2400, US-428
  - Yamaha: 01V96, 01X, 02R96, DM1000, DM2000
  - Custom Recording Light
  - iOS control surface apps that utilize OSC protocol
- Comprehensive support of any control hardware via MIDI Learn.

## Automation

- Sample-accurate, track-based automation with 32-bit resolution.
- Real-time automation recording using control surface or mouse.
- Comprehensive graphical editing.
- Grouped automation recording and editing.
- Automation Quick Access for easy hardware control of currently displayed automation parameter.
- View multiple automation parameters per track.
- Off, Read, Touch, Latch, and Write automation modes.

## Surround

- Support for all standard surround configurations:
  - Quadraphonic
  - LCRS
  - 5.1 (ITU)
  - 6.1 (ES/EX)
  - 7.1 (SDDS or 3/4.1)
- Support for multichannel interleaved and split surround audio files.
- Play back, record, or process multichannel interleaved audio files.
- Surround level metering.
- Multichannel signal routing via sends, busses, and auxiliaries.
- Graphic Surround Panner to manipulate mono or stereo streams within a surround field.
- Graphic Surround Balancer to simultaneously balance all channels of surround input.
- Support for Logic Pro True Surround plug-ins.
- Built in multi-mono support lets you use any mono or stereo Logic Pro or Audio Units plug-in.
- Surround bounce and burn to DVD-A (PCM only) disc.
- Easy mixdown to stereo and surround formats using Down Mixer plug-in.

## Video

- QuickTime video playback.
- Embedded or floating window video display.
- Digital Cinema Desktop for full-screen video display on additional monitor.
- External video output via FireWire or DVCPRO HD.

# 673\_Logic Pro 9 - Technical Specifications.pdf

- Global video thumbnail track.
- Scene detect option to mark video transitions automatically.

## **Compatibility**

- Open GarageBand songs directly in Logic Pro.
- Support for Core Audio.
- Support for Audio Units plug-ins.
- ReWire support for integration with Reason, Ableton Live, and other ReWire-compatible applications.
- Import/export of AAF, OMF, Open TL, and XML (Final Cut Pro) projects.
- Import/export of MIDI regions as MIDI files, export of MIDI and audio regions as Apple Loops.
- Play AIFF, WAV (BWF), CAF, SDII, Apple Lossless, eligible MP3, and AAC (noneligible files will be converted to PCM).
- Record AIFF, CAF, and WAV (BWF).
- Bounce to AIFF, WAV (Broadcast Wave), CAF, SDII, MP3, and M4A (Apple Lossless, AAC)
- Burn any bounced audio directly to CD or DVD-A (PCM audio only).

Published Date: Mar 12, 2013

# iPod touch 16GB (5th generation, Mid 2013) - Technical Specifications

## Size and Weight



- **Height:** 4.86 inches (123.4 mm)
- **Width:** 2.31 inches (58.6 mm)
- **Depth:** 0.24 inch (6.1 mm)
- **Weight:** 3.04 ounces (86 grams)<sup>1</sup>

## Capacity<sup>2</sup>

- 16GB

## Wireless<sup>3</sup>

- 802.11a/b/g/n Wi-Fi (802.11n 2.4GHz and 5GHz)
- Bluetooth 4.0
- Maps: Location-based service<sup>4</sup>

## Display

- 4-inch (diagonal) widescreen display with Multi-Touch IPS technology
- Retina display
- 1136-by-640-pixel resolution at 326 pixels per inch
- 800:1 contrast ratio (typical)
- 500 cd/m<sup>2</sup> max brightness (typical)
- Fingerprint-resistant oleophobic coating

## Camera, Photos, and Video

- FaceTime HD camera with 1.2MP photos and HD video (720p) up to 30 frames per second
- Face detection
- Tap to control exposure for video or stills
- Photo and video geotagging over Wi-Fi

## Input and Output

- Lightning connector
- 3.5-mm stereo headphone jack
- Built-in speaker
- Microphone

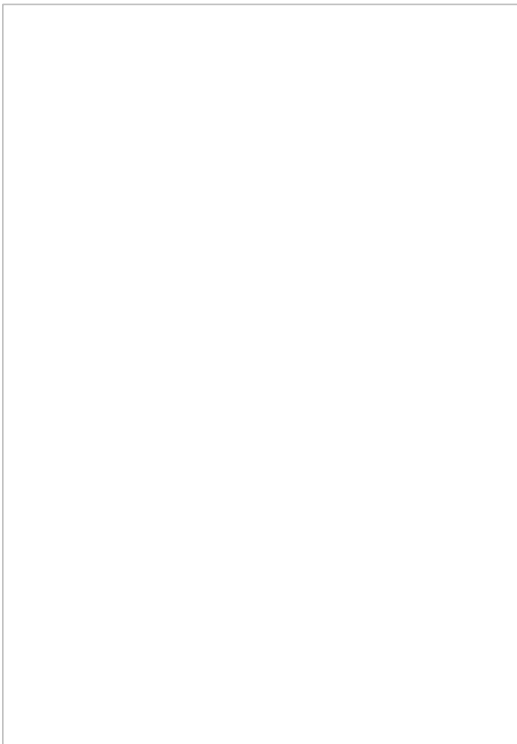
## External Buttons and Connectors

# 675\_iPod touch 16GB (5th generation, Mid 2013) - Technical Specifications.pdf

- External Buttons and Controls



- Connectors and Input/Output



## Power and Battery<sup>5</sup>

- Built-in rechargeable lithium-ion battery
- Music playback time: Up to 40 hours when fully charged
- Video playback time: Up to 8 hours when fully charged
- Charging times: Fast charge in about 2 hours (80% capacity), full charge in about 4 hours

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

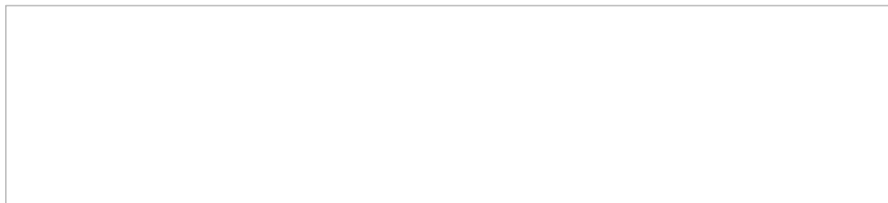
- AirPlay mirroring and video out to Apple TV (2nd and 3rd generation)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)

# 675\_iPod touch 16GB (5th generation, Mid 2013) - Technical Specifications.pdf

- H.264 video up to 1080p, 30 frames per second, Main Profile level 4.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Headphones

- Apple EarPods<sup>6</sup>



## Sensors

- Three-axis gyro
- Accelerometer

## System Requirements

- Apple ID (required for some features)
- Internet access
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X v10.6.8 or later
  - PC: Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
  - iTunes 10.7 or later<sup>7</sup> (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

### Language Support

English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### Keyboard Support

English (U.S.), English (Australian), English (Canadian), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese (Portugal), Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Tibetan, Turkish, Ukrainian, Vietnamese

### Dictionary Support

English (U.S.), English (Australian), English (Canadian), English (UK), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese (Portugal), Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese



## Siri Languages

English (U.S., UK, Canada, Australia), Spanish (U.S., Mexico, Spain), French (France, Canada, Switzerland), German (Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong)

## In the Box

- iPod touch
- Apple EarPods
- Lightning to USB Cable
- Quick Start guide

## Accessories

### Lightning to 30-pin Adapter

Connect your current accessories to iPod touch using this adapter.

### Apple World Travel Adapter Kit

Plug your Apple power adapter into most electrical outlets around the world.

### Other Accessories

- Lightning to 30-pin Adapter (0.2 m)
- Lightning to USB Cable
- AppleCare Protection Plan
- Apple USB Power Adapter
- Apple EarPods with Remote and Mic

[See more accessories in the Apple Online Store](#)

## iPod touch and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iPod touch embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:**

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Recyclable aluminum enclosure

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPod touch.

- 
1. Weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Internet access required; broadband recommended; fees may apply.
  4. For iPod touch with Maps, the Maps application provides your approximate location using information based on your proximity to known Wi-Fi networks (when on and available). The more accurate the available information, the smaller the circle identifying your position on the map. The feature is not available in all areas. Known Wi-Fi networks are predominantly in urban areas. In order to provide your location, data is collected in a form that does not personally identify you. If you do not want such data collected, do not enable the feature. Not enabling the feature will not impact the functionality of your iPod touch.
  5. Testing conducted by Apple in August 2012 and April 2013 using preproduction iPod touch hardware and software. The playlist contained

## 675\_iPod touch 16GB (5th generation, Mid 2013) - Technical Specifications.pdf

358 unique audio tracks consisting of content imported from CDs using iTunes (128-Kbps AAC) and content purchased from the iTunes Store (256-Kbps AAC); video content was purchased from the iTunes Store. iPod units were associated to a Wi-Fi network; all other settings were default. Battery tests are conducted with specific iPod units; actual results may vary. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced ([www.apple.com/support/ipod/service/battery](http://www.apple.com/support/ipod/service/battery)). Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

6. Remote and mic not included.

7. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Published Date: Oct 14, 2016

# iWork: System Requirements

## iWork (current versions) system requirements

- Pages for iOS, Numbers for iOS, and Keynote for iOS are available on the App Store. iOS 11 required. Downloading apps requires an Apple ID.
- Pages for Mac, Numbers for Mac, and Keynote for Mac are available on the Mac App Store. macOS Sierra required. Downloading apps requires an Apple ID.
- Some features may require Internet access; additional fees and terms may apply.
- iWork does not include support for some Chinese, Japanese, or Korean (CJK) text input features such as vertical text.
- Features are subject to change. iWork for iCloud is currently available worldwide in Arabic, Brazilian Portuguese, Danish, Dutch, Finnish, French, German, Hebrew, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Simplified Chinese, Spanish, Swedish, Traditional Chinese, and U.S. English and requires an iCloud account and an Internet connection. iCloud account setup requires a supported iOS device or Mac computer. iWork for iCloud works with a Mac or PC using Safari 9 or later, Internet Explorer 11 or later, or Google Chrome 50 or later.

## iWork (2013) system requirements

- Mac OS X 10.9 Mavericks and later
- Installation does not overwrite iWork '09
- iWork for Mac (Keynote 6.0, Pages 5.0, and Numbers 3.0) and iWork for iCloud Beta 2 required for iCloud document compatibility

## iWork '09 system requirements

- A Mac with an Intel, PowerPC G5, or PowerPC G4 (500MHz or faster) processor
- 512MB of RAM; 1GB recommended
- Approximately 1.2GB of available disk space
- 32MB of video memory
- Mac OS X v10.4.11 or Mac OS X v10.5.6 or later
- QuickTime 7.5.5 or later
- DVD drive required to install
- Some features may require Internet access; additional fees and terms apply

## iWork '08 system requirements

- A Mac with an Intel, PowerPC G5, or PowerPC G4 (500MHz or faster) processor
- 512MB of RAM; 1GB recommended
- 1GB of available disk space
- 32MB of video memory
- Mac OS X v10.4.10 or later
- QuickTime 7.2 or later
- iLife '08 recommended
- CD drive required to install

## iWork '06 system requirements

- A Mac with a 500MHz or faster PowerPC G4, G5, or Intel Core processor
- 256MB of RAM; 512MB recommended
- 32MB of video memory
- Mac OS X v10.3.9 or Mac OS X 10.4.3 or later
- QuickTime 7.0.3 or later
- iLife '06 or later (recommended)
- 1GB of available disk space
- DVD drive required to install

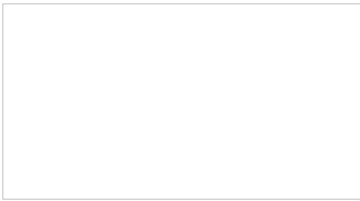
## iWork '05 system requirements

- A Mac with a 500MHz or faster PowerPC G3, G4, or G5 (G4 for PowerBook); G4 or G5 recommended
- 128MB of RAM; 512MB recommended
- 8MB of video memory
- Mac OS X v10.3.6 or later
- QuickTime 6.5 or later
- iLife '04 or later (recommended)
- 1GB of available disk space
- DVD drive required to install

# 676\_iWork- System Requirements.pdf

Published Date: May 15, 2018

# MacBook Air (11-inch, Mid 2013) - Technical Specifications



## Display

- 11.6-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions:  
1366 by 768 (native), 1344 by 756, and 1280 by 720 pixels at 16:9 aspect ratio; 1152 by 720 and 1024 by 640 pixels at 16:10 aspect ratio; 1024 by 768 and 800 by 600 pixels at 4:3 aspect ratio

## Storage<sup>1</sup>

- 128GB flash storage
- 256GB flash storage  
Configurable to 512GB flash storage.

## Processor

- 1.3GHz dual-core Intel Core i5 (Turbo Boost up to 2.6GHz) with 3MB shared L3 cache  
Configurable to 1.7GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 4MB shared L3 cache.

## Memory

- 4GB of 1600MHz LPDDR3 onboard memory  
Configurable to 8GB.

## Size and Weight

- *Height:* 0.11-0.68 inch (0.3-1.7 cm)
- *Width:* 11.8 inches (30 cm)
- *Depth:* 7.56 inches (19.2 cm)
- *Weight:* 2.38 pounds (1.08 kg)<sup>2</sup>

## Graphics and Video Support

- Intel HD Graphics 5000
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- Thunderbolt digital video output
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
  - HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

## Camera

- 720p FaceTime HD camera

## Connections and Expansion

- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt port (up to 10 Gbps)
- MagSafe 2 power port

## Wireless

- 802.11ac Wi-Fi networking;<sup>3</sup> IEEE 802.11a/b/g/n compatible

# 677\_MacBook Air (11-inch, Mid 2013) - Technical Specifications.pdf

- Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
- Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 9 hours wireless web
- Up to 8 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 38-watt-hour lithium-polymer battery
- 45W MagSafe 2 Power Adapter with cable management; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Included Software

- OS X Mountain Lion  
Includes Mail, Messages, Contacts, Calendar, Safari, Reminders, Notification Center, Notes, Dictation, iCloud, Time Machine, FaceTime, Photo Booth, AirPlay, Game Center, the Mac App Store, iTunes, Gatekeeper, Twitter and Facebook integration, and more. [Learn more about OS X Mountain Lion](#)
- iLife  
Includes iPhoto, iMovie, and GarageBand.

## Limited Warranty and Service

Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Air
- 45W MagSafe 2 Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

## Configure to Order

Configure your MacBook Air to order with these options, only at the [Apple Online Store](#):

- 1.7GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz)
- 8GB memory upgrade
- 512GB of flash storage

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**MacBook Air is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>5</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>6</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac.](#)

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Idle	2.7	5
Hard drive accessing	N/A	N/A
CD drive accessing	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Available Accessories

### Mac Software

- iWork
- Aperture
- Logic Pro
- Final Cut Pro X

### Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

### AirPort and Wireless

- AirPort Extreme Base Station
- AirPort Express Base Station
- AirPort Time Capsule
- Apple Wireless Keyboard
- Apple Magic Mouse
- Apple Magic Trackpad

### Other Accessories

## 677\_MacBook Air (11-inch, Mid 2013) - Technical Specifications.pdf

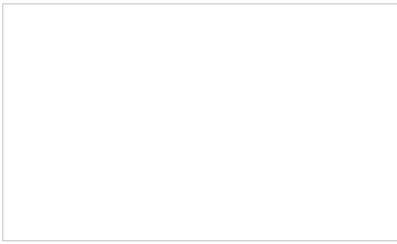
- Apple USB SuperDrive
  - Thunderbolt to Gigabit Ethernet Adapter
  - Thunderbolt to FireWire Adapter
  - AppleCare Protection Plan
  - Apple USB Ethernet Adapter
- 

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Weight varies by configuration and manufacturing process.
3. Based on an IEEE 802.11ac draft specification. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply.
4. Testing conducted by Apple in May 2013 using preproduction 1.3GHz dual-core Intel Core i5-based 13-inch MacBook Air units and preproduction 1.3GHz dual-core Intel Core i5-based 11-inch MacBook Air units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 720p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
5. PVC-free AC power cord available in all regions except India and South Korea.
6. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 13, 2016



# MacBook Air (13-inch, Mid 2013) - Technical Specifications



## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions:  
1440 by 900 (native), 1280 by 800, 1152 by 720, and 1024 by 640 pixels at 16:10 aspect ratio and 1024 by 768 and 800 by 600 pixels at 4:3 aspect ratio

## Storage<sup>1</sup>

- 128GB flash storage
- 256GB flash storage  
Configurable to 512GB flash storage.

## Processor

- 1.3GHz dual-core Intel Core i5 (Turbo Boost up to 2.6GHz) with 3MB shared L3 cache  
Configurable to 1.7GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 4MB shared L3 cache.

## Memory

- 4GB of 1600MHz LPDDR3 onboard memory  
Configurable to 8GB.

## Size and Weight

- *Height:* 0.11-0.68 inch (0.3-1.7 cm)
- *Width:* 12.8 inches (32.5 cm)
- *Depth:* 8.94 inches (22.7 cm)
- *Weight:* 2.96 pounds (1.35 kg)<sup>2</sup>

## Graphics and Video Support

- Intel HD Graphics 5000
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- Thunderbolt digital video output
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
  - HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

## Camera

- 720p FaceTime HD camera

## Connections and Expansion

- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt port (up to 10 Gbps)
- MagSafe 2 power port
- SDXC card slot

## Wireless

- 802.11ac Wi-Fi networking;<sup>3</sup> IEEE 802.11a/b/g/n compatible
- Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
- Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 12 hours wireless web
- Up to 10 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 54-watt-hour lithium-polymer battery
- 45W MagSafe 2 Power Adapter with cable management; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Included Software

- OS X Mountain Lion  
Includes Mail, Messages, Contacts, Calendar, Safari, Reminders, Notification Center, Notes, Dictation, iCloud, Time Machine, FaceTime, Photo Booth, AirPlay, Game Center, the Mac App Store, iTunes, Gatekeeper, Twitter and Facebook integration, and more. [Learn more about OS X Mountain Lion](#)
- iLife  
Includes iPhoto, iMovie, and GarageBand.

## Limited Warranty and Service

Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Air
- 45W MagSafe 2 Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

## Configure to Order

Configure your MacBook Air to order with these options, only at the [Apple Online Store](#):

- 1.7GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz)

- 8GB memory upgrade
- 512GB of flash storage

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

### MacBook Air is designed with the following features to reduce its environmental impact:

- BFR-free
- PVC-free<sup>5</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>6</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac.](#)

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Idle	2.6	5
Hard drive accessing	N/A	N/A
CD drive accessing	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Available Accessories

### Mac Software

- iWork
- Aperture
- Logic Pro
- Final Cut Pro X

## Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

## AirPort and Wireless

- AirPort Extreme Base Station
- AirPort Express Base Station
- AirPort Time Capsule
- Apple Wireless Keyboard
- Apple Magic Mouse
- Apple Magic Trackpad

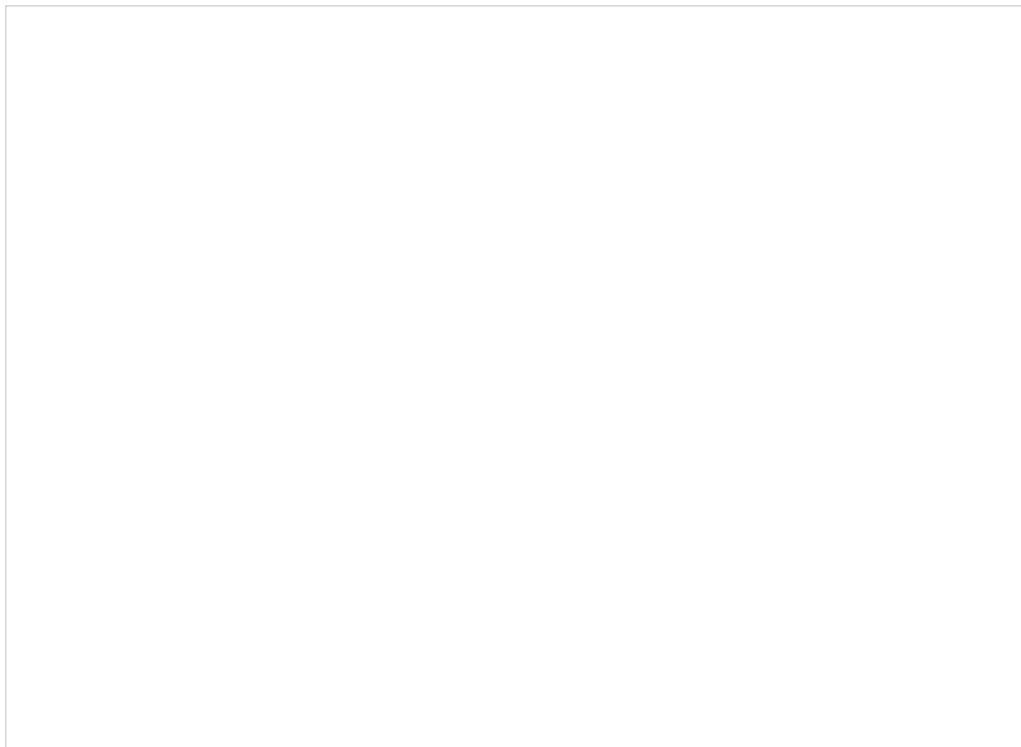
## Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- AppleCare Protection Plan
- Apple USB Ethernet Adapter

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Based on an IEEE 802.11ac draft specification. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply.
  4. Testing conducted by Apple in May 2013 using preproduction 1.3GHz dual-core Intel Core i5-based 13-inch MacBook Air units and preproduction 1.3GHz dual-core Intel Core i5-based 11-inch MacBook Air units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 720p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. PVC-free AC power cord available in all regions except India and South Korea.
  6. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Nov 1, 2017

# AirPort Time Capsule 802.11ac - Technical Specifications



## Size and Weight

- Dimensions: 3.85 inches (98 mm) by 3.85 inches (98 mm) by 6.6 inches (168 mm)
- Weight: 3.26 pounds (1.48 kg)<sup>1</sup>

## Storage<sup>2</sup>

- 2TB hard drive
- 3TB hard drive

## Wireless

- IEEE 802.11a/b/g/n/ac
- Six-element beamforming antenna array
- Simultaneous dual-band 2.4GHz and 5GHz
- Radio output power: 32.5 dBm maximum (varies by country)
- Channels 1-11, 36-116, 132-140, and 149-165 approved for use in the United States and Canada
- Channels 1-13, 36-64, and 100-140 approved for use in Europe and Japan
- Channels 1-13, 36-64, and 149-165 approved for use in Australia, Hong Kong, and New Zealand

## Compatibility

- Interoperable with 802.11a, 802.11b, 802.11g, 802.11n, and 802.11ac-enabled Mac computers, iOS devices, Apple TV, Windows-based PCs, and other Wi-Fi devices
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, IPv6 (6to4 and manual tunnels)

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>3</sup>
- WPA/WPA2 Enterprise<sup>3</sup>
- MAC address filtering
- NAT firewall
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Software and Documentation

- Printed documentation included
- [AirPort Utility for Mac available for free download](#)
- [AirPort Utility for iOS available for free download](#)
- [Bonjour for Windows available for free download](#)

## Interfaces

- Simultaneous dual-band 802.11ac wireless
- Gigabit Ethernet WAN port for connecting a DSL modem, cable modem, or Ethernet network
- USB 2 port for connecting a USB printer or hard drive<sup>4</sup>
- Three Gigabit Ethernet LAN ports for connecting a computer, Ethernet hub, or networked printer
- Built-in power supply

## Number of Users

- 50

## Electrical and Environmental Requirements

- 100-240V AC, 50-60Hz; input current: 1.5 amp
- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity (operating): 20% to 80%, noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)
- Maximum storage altitude: 15,000 feet

## Agency Approval

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268: 2003, UL 60950, CSA-C22.2 No. 60950, GB 4943.1-2011

## System Requirements

- **Setup and Administration**
  - iPhone, iPad, or iPod touch with iOS 6 or later and AirPort Utility 1.3
  - Mac with OS X Lion v10.7.5 or later and [AirPort Utility 6.3](#)
- **Wireless Device Access**
  - Any Wi-Fi-enabled device that uses the 802.11a/b/g/n/ac specification
- **Shared Printing with a USB Printer**
  - USB printer
  - Mac with OS X v10.2.7 or later
  - PC with Windows XP (SP3), Windows Vista (SP2), Windows 7 (SP1), or Windows 8
- **Shared USB Hard Drive**
  - Mac with OS X v10.4.8 or later
  - PC with Windows XP (SP3), Windows Vista (SP2), Windows 7 (SP1), or Windows 8
- **Backup using Time Machine**
  - Mac with OS X v10.5.7 or later

## AirPort Time Capsule and the Environment

Apple takes a complete product life-cycle approach to determining our environmental impact. [Learn more](#)

AirPort Time Capsule is designed with the following features to reduce its environmental impact:

- Brominated flame retardant-free
- PVC-free<sup>5</sup>
- Meets ENERGY STAR 1.0 requirements for Small network equipment

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. The Apple [Product Environmental Specification](#) details the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

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## 679\_AirPort Time Capsule 802.11ac - Technical Specifications.pdf

1. Weight varies by configuration and manufacturing process.
2. 1TB = 1 trillion bytes; actual formatted capacity less.
3. Support for Wi-Fi Protected Access (WPA/WPA2) requires OS X v10.3 or later or Windows XP with SP2 or later.
4. Some USB storage devices are compliant with the USB 2.0 power specification and can draw power from the AirPort Time Capsule. Others require separate power supplies.
5. PVC-free AC power cord available in all regions except India and South Korea.

Published Date: May 18, 2017

# Power Mac G5 (Late 2004) - Technical Specifications

## Power Mac G5 (Late 2004) - Technical Specifications

Configurations	Single 1.8GHz SuperDrive	Dual 1.8GHz SuperDrive	Dual 2GHz SuperDrive	Dual 2.5GHz SuperDrive
Model	M9555LL/A	M9454LL/A	M9455LL/A	M9457LL/A
G5 Processor	Single 1.8GHz PowerPC G5	Dual 1.8GHz PowerPC G5	Dual 2GHz PowerPC G5	Dual 2.5GHz PowerPC G5
L2 Cache	512K per processor			
Frontside bus	600MHz	900MHz per processor	1GHz per processor	1.25GHz per processor
DDR SDRAM memory	256MB PC3200 (400MHz) Supports up to 4GB		512MB PC3200 (400MHz) Supports up to 8GB	
8X AGP Pro graphics	NVIDIA GeForce FX 5200 Ultra with 64MB DDR SDRAM, DVI and ADC ports			ATI RADEON 9600 XT with 128MB DDR SDRAM, DVI and ADC ports
Hard drive <sup>(1)</sup>	80GB Serial ATA; 7200 rpm		160GB Serial ATA; 7200 rpm	
Optical drive	SuperDrive (DVD-R/CD-RW)			
PCI slots	Three open full-length 33MHz, 64-bit PCI slots		Three open full-length PCI-X slots: one 133MHz, 64-bit slot and two 100MHz, 64-bit slots	
Expansion	One FireWire 800 port, two FireWire 400 ports (one on front); three USB 2.0 ports (one on front), two USB 1.1 ports (on keyboard); AGP 8X Pro slot with graphics card installed			
Bays	Two internal hard drive bays (1 occupied); one optical drive bay (occupied)			
Networking	Built-in 10/100/1000BASE-T Ethernet and 56K V.92 modem <sup>(5)</sup>			
Wireless	AirPort Extreme ready (based on 802.11g specification; IEEE 802.11b Wi-Fi certified) <sup>(2)</sup> ; Bluetooth option			
Audio	Optical digital audio input, optical digital audio output, analog audio input, analog audio output, front headphone minijack and speaker			
System software	Mac OS X version 10.3 Panther			
Software	iLife '05 (includes iTunes, iPhoto, iMovie HD, iDVD and GarageBand), Art Directors Toolkit, EarthLink Total Access 2004, GraphicConverter, Microsoft Office 2004 for Mac Test Drive, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Zinio Reader, Mail, iChat AV, Safari, Sherlock, Address Book, QuickTime, iSync, iCal, DVD Player, Classic environment, Xcode Developer Tools			
Hardware accessories	Apple Keyboard, Apple Mouse, USB keyboard extension cable, DVI to VGA adapter, modem cable, AirPort antenna			
Limited warranty and service	Your Power Mac G5 comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.			

Build to Order Options	
Order a custom-configured computer from the online Apple Store or an authorized Apple reseller.	
Memory	(PC3200 DDR SDRAM; installed in pairs): 256MB, 512MB, 1GB, 2GB, 4GB, 8GB
Hard drives <sup>(1)</sup>	80GB Serial ATA 160GB Serial ATA 250GB Serial ATA 2X 250GB Serial ATA
Optical drives	SuperDrive (DVD-R/CD-RW), Combo drive (DVD-ROM/CD-RW)
Graphics	NVIDIA GeForce FX 5200 Ultra with 64MB of DDR SDRAM, DVI and ADC ports ATI Radeon 9600 XT with 128MB of DDR SDRAM, DVI and ADC ports ATI Radeon 9800 XT with 256MB of DDR SDRAM, DVI and ADC ports (occupies AGP slot and adjacent PCI slot) NVIDIA GeForce 6800 GT DDL with 256MB GDDR3 SDRAM, two dual-link DVI ports (occupies AGP slot and adjacent PCI slot) NVIDIA GeForce 6800 Ultra DDL with 256MB GDDR3 SDRAM, two dual-link DVI ports (occupies AGP slot and adjacent PCI slot)
Audio	Apple iPod Logitech Z-5500 5.1 Speakers T7156LL/A Monster 1m Toslink Digital Fiber Optic Cable T7153LL/A Monster 2m Toslink Digital Fiber Optic Cable T7154LL/A
External storage	Xserve RAID with Apple Fibre Channel PCI-X Card



67\_Power Mac G5 (Late 2004) - Technical Specifications.pdf

Wireless	AirPort Extreme Card M8881LL/A AirPort Extreme Base Station M8930LL/A AirPort Express Featuring AirTunes M9470LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A Internal Bluetooth module with antenna Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269Z/A
Services	AppleCare Protection Plan M8850LL/A .Mac Subscription M8778LL/A

Technical Specifications

Processing

- Single 1.8GHz, dual 1.8 GHz, dual 2GHz or dual 2.5GHz 64-bit PowerPC G5 microprocessors
- PowerPC processor architecture with 64-bit data paths and registers
- Native support for 32-bit application code
- 512K on-chip L2 cache running at processor speed
- Parallel data structure supporting up to 215 simultaneous in-flight instructions
- Simultaneous issue of up to 10 out-of-order operations
- Dual-pipeline Velocity Engine for 128-bit single-instruction, multiple-data (SIMD) processing
- Two independent double-precision floating-point units
- Advanced three-stage branch-prediction logic
- One 600MHz or two 900MHz, 1GHz or 1.25GHz 64-bit DDR frontside busses supporting up to 20 GBps data throughput
- Point-to-point system controller

Memory

- 128-bit data paths for up to 6.4 GBps memory throughput
- Single and dual 1.8GHz systems:
  - 256MB of PC3200 (400MHz) DDR SDRAM
  - Four DIMM slots supporting up to 4GB of main memory
- Dual 2GHz and dual 2.5GHz systems:
  - 512MB of PC3200 (400MHz) DDR SDRAM
  - Eight DIMM slots supporting up to 8GB of main memory
- Support for the following DIMMs (in pairs):
  - 128MB DIMMs (64-bit-wide, 128- or 256-Mbit)
  - 256MB DIMMs (64-bit-wide, 128- or 256-Mbit)
  - 512MB DIMMs (64-bit-wide, 256-Mbit)
  - 1GB DIMMs (64-bit-wide, 256-Mbit)

Graphics and displays

- AGP 8X Pro graphics slot supporting up to 2 GBps data throughput, with one of the following graphics cards installed:
  - NVIDIA GeForce FX 5200 Ultra with 64MB of DDR SDRAM, DVI and ADC ports
  - ATI Radeon 9600 XT with 128MB of DDR SDRAM, DVI and ADC ports
  - ATI Radeon 9800 XT with 256MB of DDR SDRAM, DVI and ADC ports (build-to-order option; occupies AGP slot and adjacent PCI slot)
  - NVIDIA GeForce 6800 GT DDL with 256MB GDDR3 SDRAM, two dual-link DVI ports (occupies AGP slot and adjacent PCI slot)
  - NVIDIA GeForce 6800 Ultra DDL with 256MB GDDR3 SDRAM, two dual-link DVI ports (build-to-order option; occupies AGP slot and adjacent PCI slot)
- Built-in support for digital resolutions up to 1920 x 1200 pixels. The NVIDIA GeForce 6800 Ultra DDL or NVIDIA GeForce 6800 GT DDL graphics card is required to power the 2560 x 1600-pixel resolution of the 30-inch Apple Cinema HD Displays.
- Support for analog resolutions up to 1600 x 1200 pixels
- Dual display support for extended desktop and video mirroring modes
- Support for up to two Apple Cinema Displays(2)

Storage

- Two 3.5-inch hard drive bays, each with a 150MBps Serial ATA controller; with the following hard drive options:
  - 1 80GB 7200-rpm Serial ATA; 8MB memory buffer(1)
  - 1 160GB 7200-rpm Serial ATA; 8MB memory buffer(1)
  - 1 or 2 250GB 7200-rpm Serial ATA; 8MB memory buffer(1)(build-to-order option)
- Optical drive bay with SuperDrive (DVD-R/CD-RW) installed; writes DVD-R discs at up to 8x speed, reads DVDs at up to 10x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 32x speed

PCI expansion

- Single and dual 1.8GHz systems:
  - Three open full-length 33MHz, 64-bit PCI slots
- Dual 2GHz and dual 2.5GHz systems:
  - One open full-length 133MHz, 64-bit PCI-X slot and two open full-length 100MHz, 64-bit PCI-X slots

Communications

- 10/100/1000BASE-T Ethernet (RJ-45)
- Built-in 56K V.92 modem (RJ-11) (3)
- Expansion slot for optional 54 Mbps AirPort Extreme Card (based on IEEE 802.11g specification; 802.11b Wi-Fi certified) (4)
- External AirPort Extreme antenna
- Optional internal Bluetooth 1.1 module and antenna

Peripherals and audio

- One FireWire 800 port and two FireWire 400 ports (one on front panel, 15W total power)
- Three USB 2.0 ports (one on front panel), two USB 1.1 ports on keyboard
- Front headphone minijack and speaker
- Optical digital audio input and output Toslink connectors
- Analog audio input and output minijacks

Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-125V AC or 200-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum current: 6.5A (low-voltage range) or 7.5A (high-voltage range)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

Size and weight

- Height: 20.1 inches (51.1 cm)
- Width: 8.1 inches (20.6 cm)
- Depth: 18.7 inches (47.5 cm)
- Weight: Single-processor configuration, 36 pounds (16.4 kg); dual-processor configuration, 44.4 pounds (20.2 kg) (5)

# 67\_Power Mac G5 (Late 2004) - Technical Specifications.pdf

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Second Apple flat-panel display requires ADC to DVI Adapter, sold separately. Connecting two 30-inch Apple Cinema HD Displays requires NVIDIA GeForce 6800 GT DDL or GeForce 6800 Ultra DDL card.
3. Actual rates will vary.
4. Wireless Internet access requires AirPort Extreme Card, wireless access point and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme or AirPort Express Base Station. Some ISPs are not compatible with AirPort. Range may vary with site conditions.
5. Weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

**Published Date:** Jul 26, 2017

# AirPort Extreme 802.11ac - Technical Specifications



## Size and Weight

- Dimensions: 3.85 inches (98 mm) by 3.85 inches (98 mm) by 6.6 inches (168 mm)
- Weight: 2.08 pounds (945 grams)<sup>1</sup>

## Wireless

- IEEE 802.11a/b/g/n/ac
- Six-element beamforming antenna array
- Simultaneous dual-band 2.4GHz and 5GHz
- Radio output power: 32.5 dBm maximum (varies by country)
- Channels 1-11, 36-116, 132-140, and 149-165 approved for use in the United States and Canada
- Channels 1-13, 36-64, and 100-140 approved for use in Europe and Japan
- Channels 1-13, 36-64, and 149-165 approved for use in Australia, Hong Kong, and New Zealand

## Compatibility

- Interoperable with 802.11a, 802.11b, 802.11g, 802.11n, and 802.11ac-enabled Mac computers, iOS devices, Apple TV, Windows-based PCs, and other Wi-Fi devices
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, IPv6 (6to4 and manual tunnels)

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>2</sup>
- WPA/WPA2 Enterprise<sup>2</sup>
- MAC address filtering
- NAT firewall
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Software and Documentation

- Printed documentation included
- [AirPort Utility for Mac available for free download](#)
- [AirPort Utility for iOS available for free download](#)
- [Bonjour for Windows available for free download](#)

## Interfaces

- Simultaneous dual-band 802.11ac wireless
- Gigabit Ethernet WAN port for connecting a DSL modem, cable modem, or Ethernet network
- USB 2 port for connecting a USB printer or hard drive<sup>3</sup>
- Three Gigabit Ethernet LAN ports for connecting a computer, Ethernet hub, or networked printer
- Built-in power supply

## Number of Users

- 50

## Electrical and Environmental Requirements

- 100-240V AC, 50-60Hz; input current: 1.5 amp
- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity (operating): 20% to 80%, noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)
- Maximum storage altitude: 15,000 feet

## Agency Approval

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268: 2003, UL 60950, CSA-C22.2 No. 60950, GB 4943.1-2011

## System Requirements

- **Setup and Administration**
  - iPhone, iPad, or iPod touch with iOS 6 or later and AirPort Utility 1.3
  - Mac with OS X Lion v10.7.5 or later and [AirPort Utility 6.3](#)
- **Wireless Device Access**
  - Any Wi-Fi-enabled device that uses the 802.11a/b/g/n/ac specification
- **Shared Printing with a USB Printer**
  - USB printer
  - Mac with OS X v10.2.7 or later
  - PC with Windows XP (SP3), Windows Vista (SP2), Windows 7 (SP1), or Windows 8
- **Shared USB Hard Drive**
  - Mac with OS X v10.4.8 or later
  - PC with Windows XP (SP3), Windows Vista (SP2), Windows 7 (SP1), or Windows 8

## AirPort Extreme and the Environment

Apple takes a complete product life-cycle approach to determining our environmental impact. [Learn more](#)

AirPort Extreme is designed with the following features to reduce its environmental impact:

- Brominated flame retardant-free
- PVC-free<sup>4</sup>
- Meets ENERGY STAR 1.0 requirements for Small network equipment

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. The Apple [Product Environmental Specification](#) details the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

- 
1. Weight varies by configuration and manufacturing process.
  2. Support for Wi-Fi Protected Access (WPA/WPA2) requires OS X v10.3 or later or Windows XP with SP2 or later.
  3. Some USB storage devices are compliant with the USB 2.0 power specification and can draw power from AirPort Extreme. Others require separate power supplies.
  4. PVC-free AC power cord available in all regions except India and South Korea.

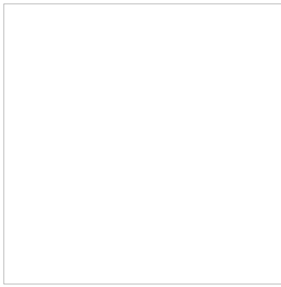
Wireless Internet access requires a wireless-enabled computer or device, a base station or other access point, and Internet access (fees may

# 680\_AirPort Extreme 802.11ac - Technical Specifications.pdf

apply).

Published Date: May 23, 2017

# Logic Pro X - Technical Specifications



## Minimum System Requirements

- 4GB of RAM
- Display with 1280-by-768 resolution or higher
- OS X 10.11 or later
- Requires 64-bit Audio Units plug-ins
- Minimum 6GB of disk space. 51GB of optional content available via in-app download.

## General

- 1220 definable key and MIDI commands
- 90 recallable screen configurations
- 200-step undo history
- Full plug-in latency compensation, also for external audio and MIDI gear
- 1/3840 note resolution for MIDI events

## Audio

- Audio file and I/O resolution up to 24 bit/192kHz
- Maximum project length greater than 6 hours at 96kHz, 13 hours at 44.1kHz
- High-end dithering algorithms (POW-r, Apogee UV22HR)
- 64-bit summing engine

## Score Editor

- Up to 16 independent voices per part
- Over 4000 predefined chord grids
- Tablature supports up to 16-string instruments with any tuning
- **Score symbols**
  - Notes and rests for various lengths
  - Auto-adapting multi-bar rests
  - Key and time signature symbols
  - Clef signs
  - Slurs and crescendo/decrescendo symbols
  - Various note head types including percussion styles
  - Accents, bowing marks, fermatas, and other symbols that apply to specific notes
  - Phrasing marks
  - Trills and other ornaments, tremolo symbols
  - Sustain pedal markings
  - Bar lines, repeat signs, and Segno and Coda markings
  - Chord symbols
  - Chord grids and tablature symbols
  - Page and line break symbols
  - Support for Bravura font
  - MusicXML import and export

## Plug-ins and Sounds

- **Plug-ins**
  - 66 effect plug-ins including Pedalboard, which includes 35 stompboxes
  - 21 software instrument plug-ins
  - 9 MIDI plug-ins

# 681\_Logic Pro X - Technical Specifications.pdf

- Custom instrument tuning system including 97 fixed tuning presets, equal-tempered, custom, and Hermode tuning
- 17 instrument and effect plug-ins with True Surround support
- **Sound Library**
  - 2767 Patches for Audio, Auxiliary, Software Instrument, and Output tracks
  - 5639 Apple Loops covering electronic genres: Hip Hop, Electro House, Dubstep, Modern R&B, Tech House, Deep House, Chillwave, Vintage Breaks, Indie Disco, Disco Funk, Blues Garage, and Chinese Traditional
  - 848 EXS24 Sampler instruments
  - 6996 plug-in settings for 85 plug-ins
  - 31 Ultrabeat electronic drum kits with 750 unique drum sounds
  - 1060 reverb spaces and warped effects for Space Designer
  - 30 groove patterns for Arpeggiator MIDI plug-in

## Mixer

- Up to 255 audio channel strips
- Up to 255 software instrument channel strips
- Up to 255 auxiliary channel strips
- Up to 256 busses
- Up to 99 external MIDI tracks
- 15 inserts for internal or Audio Units effect plug-ins
- 8 inserts for internal or Audio Units MIDI plug-ins
- 8 sends per channel strip, pre- or post-fader, or post-pan
- 32 groups for audio, software instrument, or MIDI channel strips

## Control Surface Support

- **Extensive support via control surface plug-ins**
  - Apogee Electronics GiO
  - Apple Logic Remote for iPhone and iPad
  - CM Labs: Motor Mix
  - Custom Recording Light
  - Emagic: Logic Control, XT
  - EuCon protocol support for Euphonix / AVID Artist series control surface systems
  - Frontier Design: TranzPort
  - hexler: TouchOSC
  - JL Cooper: CS-32, FaderMaster 4/100, MCS3
  - Korg: KONTROL49, microKONTROL
  - Mackie Designs: Baby HUI, HUI, Mackie Control, C4, Extender, MCU Pro, MCU XT Pro
  - M-Audio: iControl
  - Novation: all AutoMap compatible devices
  - Radikal Technologies: SAC-2k, SAC-2.2
  - Roland: SI-24
  - ROLI BLOCKS
  - Tascam: US-2400
  - Yamaha: 01V96, 01X, 02R96, DM1000, DM2000
  - Comprehensive support for any control hardware via MIDI Learn
- **Additional plug-ins available from third-party manufacturers**
  - Frontier Design: AlphaTrack
  - Jazzmutant: Dexter
  - Korg: nanoKONTROL
  - M-Audio: Axiom, Axiom Pro, Axiom AIR, Oxygen
  - Presonus: FaderPort
  - Roland: VS-20
  - Smart AV: Smart Console

## Surround

- **Support for all standard surround configurations**
  - Quadraphonic
  - LCRS
  - 5.1 (ITU)
  - 6.1 (ES/EX)
  - 7.1 (SDDS or 3/4.1)

## Compatibility

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- Open projects from Logic 5 or later
- Open GarageBand songs directly in Logic Pro X
- Support for Core Audio-compliant MIDI and audio hardware
- Support for Audio Units effect, instrument, and MIDI plug-ins
- ReWire support for Propellerhead Reason, Ableton Live, and other compatible applications
- Import/Export of AAF and XML (Final Cut Pro X) projects
- Import/Export of MIDI regions as MIDI files, export of MIDI and audio regions as Apple Loops
- Import/Export music notation to MusicXML
- Play AIFF, WAV (BWF), CAF, SDII, Apple Lossless, eligible MP3, and AAC (noneligible files will be converted to PCM)
- Record AIFF, CAF, and WAV (BWF)
- Bounce to AIFF, WAV (Broadcast Wave), CAF, MP3, and M4A (Apple Lossless, AAC)
- Burn any bounced audio directly to CD or DVD-A (PCM audio only)

Published Date: Mar 29, 2017



# MacBook Air (13-inch, Mid 2011) - Technical Specifications

## Display

- High-resolution LED-backlit glossy widescreen display with support for millions of colors.
- 13.3-inch (diagonal) high-resolution LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions: 1440 by 900 (native), 1280 by 800, 1152 by 720, and 1024 by 640 pixels at 16:10 aspect ratio; 1024 by 768 and 800 by 600 pixels at 4:3 aspect ratio

## Size and Weight

Ultrathin and ultralight unibody aluminum construction.

- *Height:* 0.11-0.68 inch (0.3-1.7 cm)
- *Width:* 12.8 inches (32.5 cm)
- *Depth:* 8.94 inches (22.7 cm)
- *Weight:* 2.96 pounds (1.35 kg)<sup>1</sup>

## Storage

All-flash storage.<sup>2</sup>

- 128GB flash storage
- 256GB flash storage

## Processor and Memory

Powered by a dual-core Intel Core i5 or i7 processor and DDR3 memory.

- Processor
  - 1.7GHz dual-core Intel Core i5 with 3MB shared L3 cache
  - 256GB model configurable to dual-core 1.8GHz Intel Core i7 with 4MB shared L3 cache, only at the Apple Online Store.
- Memory
  - 4GB of 1333MHz DDR3 onboard memory

## Graphics

Advanced Intel HD Graphics 3000.

- Intel HD Graphics 3000 processor with 384MB of DDR3 SDRAM shared with main memory<sup>3</sup>

## Video Support and Camera

Built-in FaceTime camera.

- FaceTime camera
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors

## Connections and Expansion

USB 2.0, Thunderbolt, headphone port, MagSafe power port, SD card slot (13-inch model).

□

- Two USB 2.0 ports (up to 480 Mbps)
- Thunderbolt port
- SD card slot

## Battery and Power

Advanced lithium-polymer battery with MagSafe power adapter.<sup>4</sup>

- Up to 7 hours wireless web

# 683\_MacBook Air (13-inch, Mid 2011) - Technical Specifications.pdf

- Up to 30 days standby time
- Built-in 50-watt-hour lithium-polymer battery; 45W MagSafe Power Adapter with cable management system; MagSafe power port

## Wireless

Latest Wi-Fi and Bluetooth technologies.

- Wi-Fi  
802.11n Wi-Fi wireless networking;<sup>5</sup> IEEE 802.11a/b/g compatible
- Bluetooth  
Bluetooth 4.0 wireless technology

## Audio

Stereo speakers, microphone, and headphone.

- Stereo speakers
- Omnidirectional microphone
- Headphone port
- Support for Apple Earphones with Remote and Mic

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Limited Warranty and Service

Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

## DVD or CD Sharing

With the Mac App Store, getting the apps you want on your Mac has never been easier. No more boxes, no more discs, no more time-consuming installation. Click once to download and install any app on your Mac. But if an app you need isn't available from the Mac App Store, you can use DVD or CD Sharing. This convenient feature of OS X lets you wirelessly "borrow" the optical drive of a nearby Mac or PC. So you can install applications from a DVD or CD and have full access to an optical drive without having to carry one around.

## In the Box

- MacBook Air
- 45W MagSafe Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

## Included Software

### OS X Lion

Includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more. [Learn more about OS X Lion](#)

### Lion Recovery

OS X Lion includes a built-in set of tools for repairing your Mac in the Recovery HD, a new feature that lets you repair disks or reinstall OS X Lion without a physical disc. [Learn more about Lion Recovery](#)

### iLife

Includes iPhoto, iMovie, and GarageBand.

## Configurable Options

Purchase from the Apple Online Store to upgrade processor, memory, and flash storage.

- 1.8GHz dual-core Intel Core i7
- Apple USB Ethernet Adapter
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter

[Configure your MacBook Air with even more options, only at the Apple Online Store](#)

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact.

**MacBook Air is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>6</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn about Apple's dedication to reducing the environmental impact of our products and process.](#) Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac or PC.](#)

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Idle	2.5	8.0
Hard drive accessing	N/A	N/A
CD drive accessing	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Express
- Final Cut Pro X

### Displays and Graphics

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter<

### AirPort and Wireless

- Apple USB Ethernet Adapter
- AirPort Extreme Base Station
- Time Capsule
- Apple Wireless Keyboard
- Apple Magic Mouse

## Other Accessories

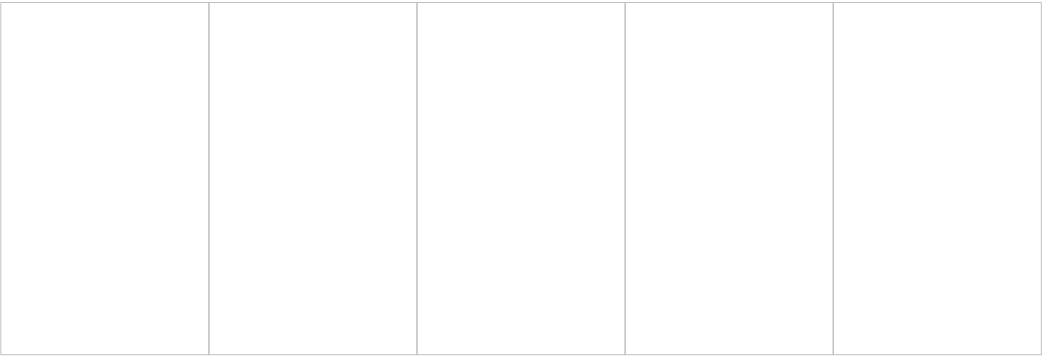
- Apple MacBook Air SuperDrive
- Apple Keyboard
- AppleCare Protection Plan

- 
1. Actual weight varies by configuration and manufacturing process.
  2. 1GB=1 billion bytes; actual formatted capacity less.
  3. Memory available to OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB or 384MB.
  4. Testing conducted by Apple in July 2011 using preproduction 1.7GHz dual-core Intel Core i5–based 13-inch MacBook Air units and preproduction 1.6GHz dual-core Intel Core i5–based 11-inch MacBook Air units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. The standby test measures battery life by allowing a system, connected to a wireless network, to enter deep sleep mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  6. PVC-free AC power cord is available in Australia, Japan, New Zealand, North and South America, Switzerland, Taiwan, Thailand, and the United Kingdom.
  7. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Aug 29, 2017

# iPhone 5c - Technical Specifications

## Color



- White
- Pink
- Yellow
- Blue
- Green

## Capacity<sup>1</sup>

- 16GB
- 32GB

## Weight & Dimensions<sup>2</sup>

- Height: 4.90 inches (124.4 mm)
- Width: 2.33 inches (59.2 mm)
- Depth: 0.35 inch (8.97 mm)
- Weight: 4.65 ounces (132 grams)

## Chip

- A6 chip

## Cellular and Wireless

- Model A1532 (GSM)\*: UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 2, 3, 4, 5, 8, 13, 17, 19, 20, 25)
- Model A1532 (CDMA)\*: CDMA EV-DO Rev. A and Rev. B (800, 1700/2100, 1900, 2100 MHz); UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 2, 3, 4, 5, 8, 13, 17, 19, 20, 25)
- Model A1456\*: CDMA EV-DO Rev. A and Rev. B. (800, 1700/2100, 1900, 2100 MHz); UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 2, 3, 4, 5, 8, 13, 17, 18, 19, 20, 25, 26)
- Model A1507\*: UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 2, 3, 5, 7, 8, 20)
- Model A1529\*: UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); FDD-LTE (Bands 1, 2, 3, 5, 7, 8, 20); TD-LTE (Bands 38, 39, 40)
- 802.11a/b/g/n Wi-Fi (802.11n 2.4GHz and 5GHz)
- Bluetooth 4.0 wireless technology

## Location

- Assisted GPS and GLONASS
- Digital compass
- Wi-Fi
- Cellular

## Display

- Retina display
- 4-inch (diagonal) widescreen Multi-Touch display

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- 1136-by-640-pixel resolution at 326 ppi
- 800:1 contrast ratio (typical)
- 500 cd/m<sup>2</sup> max brightness (typical)
- Fingerprint-resistant oleophobic coating on front
- Support for display of multiple languages and characters simultaneously

## iSight Camera

- 8 megapixels
- *f*/2.4 aperture
- LED flash
- Backside illumination sensor
- Five-element lens
- Hybrid IR filter
- Autofocus
- Tap to focus
- Face detection
- Panorama
- Photo geotagging

## Video Recording

- 1080p HD video recording
- 30 fps
- LED light
- Video stabilization
- Take still photo while recording video
- Face detection
- 3x zoom
- Video geotagging

## Facetime Camera

- 1.2MP photos (1280 by 960)
- 720p HD video recording
- Backside illumination sensor

## Video Calling<sup>3</sup>

- FaceTime
- iPhone 5c to any FaceTime-enabled device over Wi-Fi or cellular
- Initiate video calls over LTE, DC-HSDPA, HSPA+, 3G, and 2G
- HVGA-resolution (480 by 368) calls over Wi-Fi

## Audio Calling<sup>3</sup>

- FaceTime
- iPhone 5c to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay mirroring and video out to Apple TV (2nd and 3rd generation)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 1080p, 30 frames per second, High Profile level 4.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Intelligent Assistant<sup>4</sup>

- [Siri](#)  
Use your voice to send messages, set reminders, and more.

## External Buttons and Connectors

- On/off - Sleep/wake
- Volume up/down
- Ring/silent
- Home
- 3.5-mm stereo headphone minijack
- Microphone
- Built-in speaker
- Lightning connector

## Power and Battery<sup>5</sup>

- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter
- Talk time: Up to 10 hours on 3G
- Standby time: Up to 250 hours
- Internet use: Up to 8 hours on 3G, up to 10 hours on LTE, up to 10 hours on Wi-Fi
- Video playback: Up to 10 hours
- Audio playback: Up to 40 hours

## Sensors

- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Built-in Apps

- Maps
- Messages
- Passbook
- Camera
- Reminders
- Notes
- Phone
- Videos
- Weather
- FaceTime
- iTunes Store
- Stocks
- Music
- Game Center
- Calculator
- Safari
- Calendar
- Voice Memos
- App Store
- Contacts
- Mail
- Newsstand

## Free Apps from Apple<sup>6</sup>

- iPhoto
- iMovie
- Keynote
- Pages

- Numbers
- iBooks
- iTunes U
- iTunes Festival
- Podcasts
- Trailers
- Find My iPhone
- Remote
- Find My Friends

## Headphones

- Apple EarPods with Remote and Mic
- Storage and travel case

## SIM Card

- Nano-SIM
- iPhone 5c is not compatible with existing micro-SIM cards.

## Connector

- Lightning

## Rating for Hearing Aids

- iPhone 5c (Model A1532, A1456): M3, T4
- iPhone 5c (Model A1507, A1529): M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>7</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X v10.6.8 or later
  - PC: Windows 8; Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
  - iTunes 11.1 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

- **Language support**  
English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **Keyboard support**  
English (U.S.), English (Canadian), English (UK), English (Australian), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Tamil, Thai, Tibetan, Turkish, Ukrainian, Vietnamese



- **Dictionary support (enables predictive text and autocorrect)**

English (U.S.), English (Canadian), English (UK), English (Australian), Chinese (Simplified), Chinese (Traditional), French, French (Canadian), French (Switzerland), German, Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Indonesian, Latvian, Lithuanian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Tamil, Thai, Turkish, Ukrainian, Vietnamese

- **Siri languages**

English (U.S., UK, Canada, Australia), Spanish (U.S., Mexico, Spain), French (France, Canada, Switzerland), German (Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong)

## In the Box

- iPhone 5c with iOS 7
- Apple EarPods with Remote and Mic
- Lightning to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iPhone 5c embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:**

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Power adapter outperforms strictest global energy efficiency standards

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPhone.

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\*To identify your iPhone model number, see <http://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).

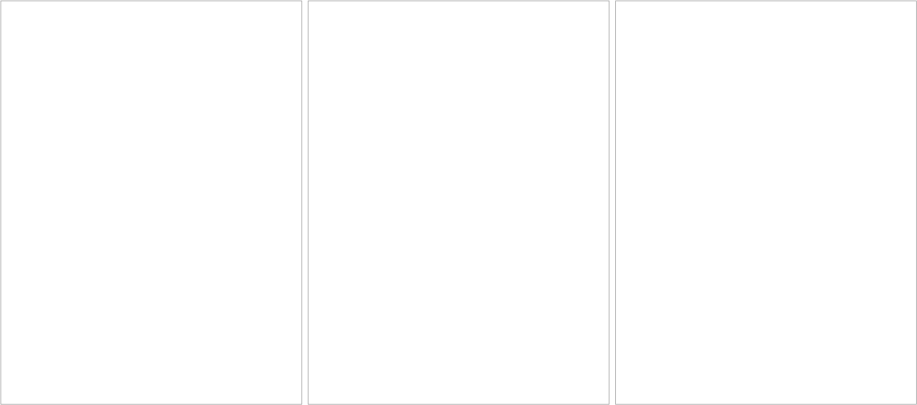
1. 1GB = 1 billion bytes; actual formatted capacity less. Requires a plan (which may include restrictions on switching service providers and roaming, even after contract expiration); sold separately to qualified customers. Credit check required; must be 18 or older. Wireless service is provided by and is the sole responsibility of your wireless service provider. Some capabilities are not available in all areas and depend on your wireless plan and service provider network. Service may not be available in all areas or at the signal strength, rates, speeds, or bandwidth as demonstrated. Some features may require added fees. Contact your wireless service provider for more details. Customers who want to upgrade from another phone or replace a previous-generation iPhone should check with their wireless service provider for pricing options. For those who are not qualified customers, are not eligible for an early upgrade, are purchasing an unlocked iPhone, or wish to buy an iPhone as a gift, see your carrier, an Apple Retail Store Specialist, the Apple Online Store, or an Apple Authorized Reseller for pricing. In CA and RI, sales tax is collected on the unbundled price of iPhone. Wi-Fi Internet access required for some features; fees may apply. Use constitutes acceptance of Apple's software license agreement. Warranty information is also available at [www.apple.com/legal/warranty](http://www.apple.com/legal/warranty). Unauthorized modification of your iPhone software violates the software license agreement. Inability to use an iPhone due to unauthorized modifications is not covered under your warranty.
2. Size and weight vary by configuration and manufacturing process.
3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
4. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
5. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
6. iPhoto, iMovie, Keynote, Pages, and Numbers are free on the App Store for qualifying iOS 7 compatible devices activated after September 1, 2013. See [www.apple.com/ios/whats-new/](http://www.apple.com/ios/whats-new/) for iOS 7 compatible devices. Downloading apps requires an Apple ID.
7. Wireless broadband recommended; fees may apply.

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Some features may not be available for all countries or all areas. [Click here to see complete list.](#)  
Application and service availability and pricing are subject to change.

Published Date: May 16, 2018

# iPhone 5s - Technical Specifications



## Finish

- Space Gray
- Gold
- Silver

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB

## Weight & Dimensions<sup>2</sup>

- Height: 4.87 inches (123.8 mm)
- Width: 2.31 inches (58.6 mm)
- Depth: 0.30 inch (7.6 mm)
- Weight: 3.95 ounces (112 grams)

## Chips

- A7 chip with 64-bit architecture
- M7 motion coprocessor

## Cellular and Wireless

- Model A1533 (GSM)\*: UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 2, 3, 4, 5, 8, 13, 17, 19, 20, 25)
- Model A1533 (CDMA)\*: CDMA EV-DO Rev. A and Rev. B (800, 1700/2100, 1900, 2100 MHz); UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 2, 3, 4, 5, 8, 13, 17, 19, 20, 25)
- Model A1453\*: CDMA EV-DO Rev. A and Rev. B (800, 1700/2100, 1900, 2100 MHz); UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 2, 3, 4, 5, 8, 13, 17, 18, 19, 20, 25, 26)
- Model A1457\*: UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); LTE (Bands 1, 2, 3, 5, 7, 8, 20)
- Model A1530\*: UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz); FDD-LTE (Bands 1, 2, 3, 5, 7, 8, 20); TD-LTE (Bands 38, 39, 40)
- 802.11a/b/g/n Wi-Fi (802.11n 2.4GHz and 5GHz)
- Bluetooth 4.0 wireless technology

## Location

- Assisted GPS and GLONASS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Touch ID

# 685\_iPhone 5s - Technical Specifications.pdf

- Fingerprint identity sensor built into the Home button

## Display

### Retina display

- 4-inch (diagonal) LED-backlit widescreen Multi-Touch display with IPS technology
- 1136-by-640-pixel resolution at 326 ppi
- 800:1 contrast ratio (typical)
- 500 cd/m2 max brightness (typical)
- Full sRGB standard
- Fingerprint-resistant oleophobic coating on front
- Support for display of multiple languages and characters simultaneously

## iSight Camera

- 8 megapixels with 1.5 $\mu$  pixels
- *f*/2.2 aperture
- Sapphire crystal lens cover
- True Tone flash
- Backside illumination sensor
- Five-element lens
- Hybrid IR filter
- Autofocus
- Tap to focus
- Exposure control
- Auto HDR for photos
- Face detection
- Panorama
- Auto image stabilization
- Burst mode
- Photo geotagging

## Video Recording

- 1080p HD video recording (30 fps)
- True Tone flash
- Slo-mo video (120 fps)
- Time-lapse video
- Video stabilization
- Take still photos while recording video
- Face detection
- 3x zoom
- Video geotagging

## FaceTime Camera

- 1.2MP photos (1280 by 960)
- *f*/2.4 aperture
- 720p HD video recording
- Auto HDR for photos
- Backside illumination sensor
- Face detection
- Exposure control

## Video Calling<sup>3</sup>

- FaceTime
- iPhone 5s to any FaceTime-enabled device over Wi-Fi or cellular
- HVGA-resolution (480 by 368) calls over Wi-Fi

## Audio Calling<sup>3</sup>

- FaceTime
- iPhone 5s to any FaceTime-enabled device over Wi-Fi or cellular

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- Wi-Fi calling<sup>4</sup>

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 1080p, 60 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## External Buttons and Connectors

- On/off - Sleep/wake
- Volume up/down
- Ring/silent
- Home/Touch ID sensor
- 3.5-mm stereo headphone minijack
- Microphone
- Built-in speaker
- Lightning connector

## Power and Battery<sup>5</sup>

- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter
- Talk time: Up to 10 hours on 3G
- Standby time: Up to 10 days
- Internet use: Up to 8 hours on 3G, up to 10 hours on LTE, up to 10 hours on Wi-Fi
- Video playback: Up to 10 hours
- Audio playback: Up to 40 hours

## Sensors

- Touch ID
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Calendar
- iTunes Store
- App Store
- Notes
- News

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- Contacts
- iBooks
- Game Center
- Weather
- Reminders
- Clock
- Videos
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- iCloud Drive

## Free Apps from Apple<sup>6</sup>

- iMovie
- Pages
- Keynote
- Numbers
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Remote
- Find My iPhone
- Find My Friends

## Headphones

- Apple EarPods with Remote and Mic
- Storage and travel case

## SIM Card

- Nano-SIM
- iPhone 5s is not compatible with existing micro-SIM cards.

## Connector

- Lightning

## Rating for Hearing Aids

- iPhone 5s (Model A1453, A1533): M3, T4
- iPhone 5s (Model A1457, A1530): M4, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>7</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X v 10.8.5 or later
  - PC: Windows 7 or later
  - iTunes 12.3 or later (free download from [www.apple.com/itunes/download](http://www.apple.com/itunes/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

### • **Language Support**

English (Australia, Canada, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • **QuickType keyboard support**

English (Australia, Canada, India, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Canada, France, Switzerland), German (Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish, Arabic, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Marathi, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swedish, Tamil, Thai, Turkish, Ukrainian, Urdu, Vietnamese

### • **QuickType keyboard support with predictive input<sup>8</sup>**

English (Australia, Canada, India, UK, U.S.), Chinese (Simplified, Traditional), French (Canada, France, Switzerland), German (Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

### • **Dictation languages**

English (Australia, Canada, India, Ireland, New Zealand, Philippines, Singapore, South Africa, UK, U.S.), Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic, Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovakian, Swedish, Turkish, Thai, Ukrainian, Vietnamese

### • **Siri languages**

English (Australia, Canada, India, New Zealand, Singapore, UK, U.S.), Spanish (Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Swedish (Sweden), Danish (Denmark), Dutch (Belgium, Netherlands), Norwegian (Norway), Russian (Russia), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)

### • **Definition dictionary support**

English, Chinese (Simplified), French, German, Hindi, Italian, Japanese, Korean, Spanish, Dutch, Norwegian, Portuguese (Brazil), Russian, Swedish, Thai, Turkish

### • **Bilingual dictionary support**

Chinese (Simplified), French, German, Japanese, Korean, Spanish

### • **Spell check**

English (Australia, Canada, UK, U.S.), French, German, Italian, Spanish, Danish, Dutch, Polish, Portuguese (Brazil, Portugal), Russian, Swedish, Turkish

## In the Box

- iPhone 5s
- Apple EarPods with Remote and Mic
- Lightning to USB Cable
- 5W USB Power Adapter

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPhone 5s embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Power adapter outperforms strictest global energy efficiency standards

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [Apple Product Environmental Reports](#) detail the environmental attributes of our products.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your iPhone.

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\*To identify your iPhone model number, see <http://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).

1. 1GB = 1 billion bytes; actual formatted capacity less. Requires an installment agreement or a 2-year contract and plan (which may include restrictions on switching service providers and roaming, even after contract expiration); sold separately to qualified customers. Credit check required; must be 18 or older; upgrade or activation fee from your wireless service provider may apply. Wireless service is provided by and is the sole responsibility of your wireless service provider. Some capabilities are not available in all areas and depend on your wireless plan and service provider network. Service may not be available in all areas or at the signal strength, rates, speeds, or bandwidth as demonstrated. Some features may require added fees. Contact your wireless service provider for more details. Customers who want to upgrade from another phone or replace a previous-generation iPhone should check with their wireless service provider for pricing options. For those who are not qualified customers, are not eligible for an early upgrade, are purchasing an unlocked iPhone, or wish to buy an iPhone as a gift, see your carrier, an Apple Retail Store Specialist, [apple.com](http://apple.com), or an Apple Authorized Reseller for pricing. In CA and RI, sales tax is collected on the unbundled price of iPhone. Wi-Fi Internet access required for some features; fees may apply. Use constitutes acceptance of Apple's software license agreement. Warranty information is also available at [www.apple.com/legal/warranty/iphone](http://www.apple.com/legal/warranty/iphone). Unauthorized modification of your iPhone software violates the software license agreement. Inability to use an iPhone due to unauthorized modifications is not covered under your warranty.
2. Size and weight vary by configuration and manufacturing process.
3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
4. LTE and Wi-Fi calling are available in selected markets and through selected carriers. Speeds are based on theoretical throughput and vary based on site conditions. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
5. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
6. iMovie, GarageBand, Pages, Numbers, and Keynote are free on the App Store for qualifying iOS 9 compatible devices with initial activation on or after September 1, 2013. See [www.apple.com/ios/whats-new](http://www.apple.com/ios/whats-new) for iOS 9 compatible devices. Downloading apps requires an Apple ID.
7. Wireless broadband recommended; fees may apply.
8. Customized suggestions based on recipient and app are not available for Chinese (Simplified, Traditional), Japanese, Korean, and Thai.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Application and service availability and pricing are subject to change.

Published Date: May 16, 2018



# OS X Mountain Lion Server - Technical Specifications

## General Requirements

- Mac computer running Mountain Lion.
- 2GB of memory.
- 10GB of available disk space; some features require additional disk space.
- Some features require an Apple ID; terms apply.
- Some features require a compatible Internet service provider; fees may apply.
- Some features are not available in all countries.

## What's Included in OS X Server

### Applications

- Server app
- Xsan Admin

### Services

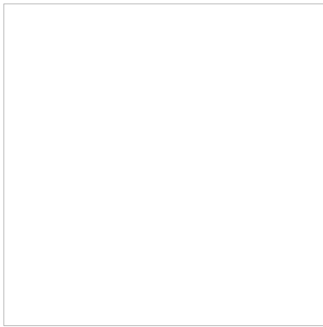
- AFP
- Caching Server
- Calendar Server
- Contacts Server
- DHCP
- DNS
- FTP
- Mail Server
- Messages Server
- NetBoot, NetInstall, NetRestore
- Open Directory
- Profile Manager
- Software Update Server
- Time Machine
- VPN
- Web Server
- Wiki Server
- Xsan

### Languages

- English
- Japanese
- French
- German
- Simplified Chinese
- Dutch
- Italian
- Korean
- Spanish
- Traditional Chinese

Published Date: Sep 20, 2013

# iMac (21.5-inch, Late 2013) - Technical Specifications



## Display

- 21.5-inch (diagonal) LED-backlit display with IPS technology; 1920-by-1080 resolution with support for millions of colors

## Processor

- **2.7GHz**  
2.7GHz quad-core Intel Core i5 processor (Turbo Boost up to 3.2GHz) with 4MB L3 cache
- **2.9GHz**  
2.9GHz quad-core Intel Core i5 processor (Turbo Boost up to 3.6GHz) with 6MB L3 cache  
*Configurable to 3.1GHz quad-core Intel Core i7 (Turbo Boost up to 3.9GHz).*

## Memory

- 8GB (two 4GB) of 1600MHz DDR3 memory  
*Configurable to 16GB.*

## Storage<sup>1</sup>

- 1TB (5400-rpm) hard drive  
*Configurable to 1TB Fusion Drive or 256GB or 512GB of flash storage.*

## Graphics

- **2.7GHz**  
Intel Iris Pro graphics
- **2.9GHz**  
NVIDIA GeForce GT 750M graphics processor with 1GB of GDDR5 memory

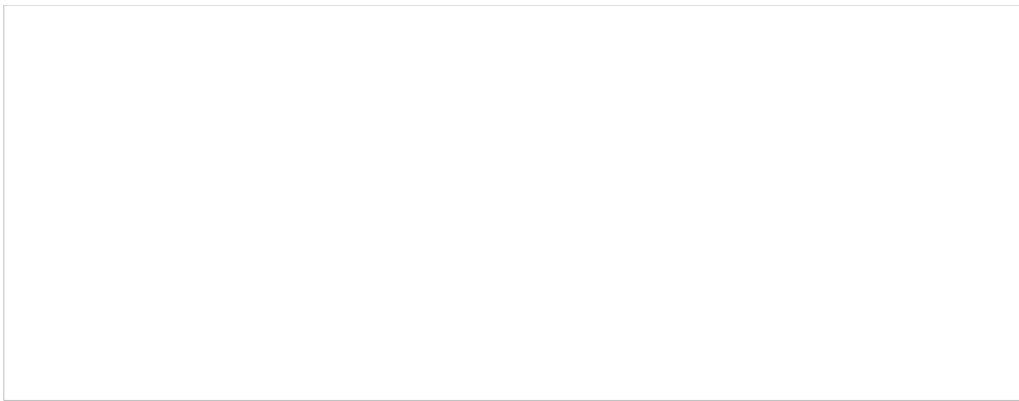
## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display
- Support for extended desktop and video mirroring modes
- Support for Target Display Mode via the Thunderbolt port using a Thunderbolt to Thunderbolt cable (sold separately)

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone

## Connections and Expansion



- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt ports
- Mini DisplayPort output with support for DVI, VGA, and dual-link DVI (adapters sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Kensington lock slot

## Input

### Apple Wireless Keyboard

Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)

### Magic Mouse

Smooth, seamless Multi-Touch surface with support for simple gestures (scrolling and swiping). Click and double-click anywhere. Ambidextrous construction accommodates left- and right-handed users.

### Magic Trackpad

Glass Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch and expand, swipe, three-finger swipe, four-finger swipe, tap, double-tap, rotate, screen zoom, scroll, click and drag, click drag and lock, secondary click A and B.

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Size and Weight

- *Height:* 17.7 inches (45.0 cm)
- *Width:* 20.8 inches (52.8 cm)
- *Stand depth:* 6.9 inches (17.5 cm)
- *Weight:* 12.5 pounds (5.68 kg)<sup>3</sup>

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet

## Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer’s purchase date. Only the [AppleCare Protection Plan](#) provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple- authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- iMac

# 687\_iMac (21.5-inch, Late 2013) - Technical Specifications.pdf

- Apple Wireless Keyboard
- Apple Magic Mouse
- Power cord

## Included Software

- **OS X Mountain Lion:** The world's most advanced desktop operating system. [Learn more](#)
- Mac App Store
- Safari
- Mail
- Messages
- Calendar
- Contacts
- Reminders
- Notes
- Time Machine
- FaceTime
- Photo Booth
- Game Center
- iTunes
- **iLife:** iPhoto, iMovie, and GarageBand.

## Configure to Order

Configure your iMac with these options, only at the [Apple Online Store](#).

Looking for an iMac you can mount on a wall or adjustable arm? [Choose an iMac with a Built-in VESA Mount Adapter](#).

- **21.5-inch iMac 2.7GHz**
  - Magic Trackpad
  - 16GB memory upgrade (two 8GB)
  - 1TB Fusion Drive
  - 256GB or 512GB of flash storage
- **21.5-inch iMac 2.9GHz**
  - Magic Trackpad
  - 16GB memory upgrade (two 8GB)
  - 1TB Fusion Drive
  - 256GB or 512GB of flash storage
  - 3.1GHz quad-core Intel Core i7 (Turbo Boost up to 3.9GHz) with 8MB L3 cache

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iMac is designed with the following features to reduce its environmental impact:**

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>4</sup>
- Mercury-free LED-backlit display
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>5</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac](#).

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB	Sound Pressure Level Operator Position $L_{pAm}$ (dB)
Idle	2.9	12
Hard drive accessing	2.9	12
CD drive accessing	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Pro X
- Final Cut Pro X

### Adapters

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort and Wireless

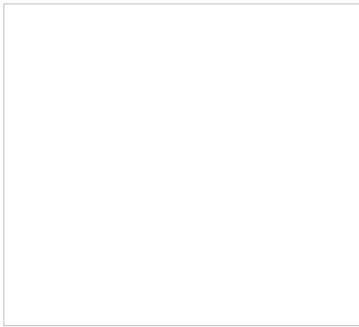
- AirPort Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station

### Other Accessories

- Magic Trackpad
- Apple USB SuperDrive
- Apple Battery Charger
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Based on an IEEE 802.11ac draft specification.
  3. Weight varies by configuration and manufacturing process.
  4. PVC-free AC power cord available in all regions except South Korea.
  5. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

# iMac (27-inch, Late 2013) - Technical Specifications



## Display

- 27-inch (diagonal) LED-backlit display with IPS technology; 2560-by-1440 resolution with support for millions of colors

## Processor

- **3.2GHz**  
3.2GHz quad-core Intel Core i5 processor (Turbo Boost up to 3.6GHz) with 6MB L3 cache
- **3.4GHz**  
3.4GHz quad-core Intel Core i5 processor (Turbo Boost up to 3.8GHz) with 6MB L3 cache  
*Configurable to 3.5GHz quad-core Intel Core i7 (Turbo Boost up to 3.9GHz).*

## Memory

- 8GB (two 4GB) of 1600MHz DDR3 memory; four user-accessible SO-DIMM slots  
*Configurable to 16GB or 32GB.*

## Storage<sup>1</sup>

- 1TB (7200-rpm) hard drive  
*Configurable to 3TB hard drive, 1TB or 3TB Fusion Drive, or 256GB, 512GB, or 1TB of flash storage.*

## Graphics

- **3.2GHz**  
NVIDIA GeForce GT 755M graphics processor with 1GB of GDDR5 memory
- **3.4GHz**  
NVIDIA GeForce GTX 775M graphics processor with 2GB of GDDR5 memory  
*Configurable to NVIDIA GeForce GTX 780M with 4GB of GDDR5 memory.*

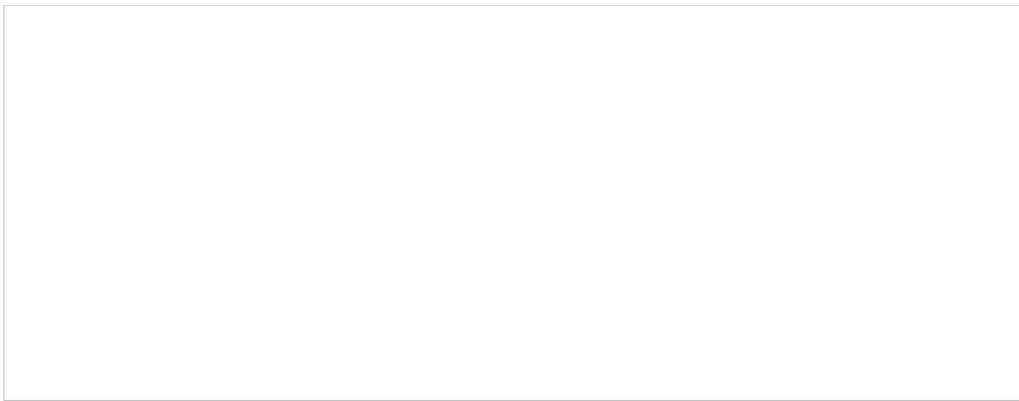
## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display
- Support for extended desktop and video mirroring modes
- Support for Target Display Mode via the Thunderbolt port using a Thunderbolt to Thunderbolt cable (sold separately)

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone

## Connections and Expansion



- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt ports
- Mini DisplayPort output with support for DVI, VGA, and dual-link DVI (adapters sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Kensington lock slot

## Input

### Apple Wireless Keyboard

Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)

### Magic Mouse

Smooth, seamless Multi-Touch surface with support for simple gestures (scrolling and swiping). Click and double-click anywhere. Ambidextrous construction accommodates left- and right-handed users.

### Magic Trackpad

Glass Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch and expand, swipe, three-finger swipe, four-finger swipe, tap, double-tap, rotate, screen zoom, scroll, click and drag, click drag and lock, secondary click A and B.

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Size and Weight

- *Height:* 20.3 inches (51.6 cm)
- *Width:* 25.6 inches (65.0 cm)
- *Stand depth:* 8 inches (20.3 cm)
- *Weight:* 21 pounds (9.54 kg)<sup>3</sup>

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet

## Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer’s purchase date. Only the [AppleCare Protection Plan](#) provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple- authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- iMac

# 688\_iMac (27-inch, Late 2013) - Technical Specifications.pdf

- Apple Wireless Keyboard
- Apple Magic Mouse
- Power cord

## Included Software

- **OS X Mountain Lion:** The world's most advanced desktop operating system. [Learn more](#)
- Mac App Store
- Safari
- Mail
- Messages
- Calendar
- Contacts
- Reminders
- Notes
- Time Machine
- FaceTime
- Photo Booth
- Game Center
- iTunes
- **iLife:** iPhoto, iMovie, and GarageBand.

## Configure to Order

Configure your iMac with these options, only at the [Apple Online Store](#).

Looking for an iMac you can mount on a wall or adjustable arm? [Choose an iMac with a Built-in VESA Mount Adapter](#).

- **27-inch iMac 3.2GHz**
  - Magic Trackpad
  - 16GB memory upgrade (two 8GB)
  - 32GB memory upgrade (four 8GB)
  - 3TB hard drive
  - 1TB or 3TB Fusion Drive
  - 256GB, 512GB, or 1TB of flash storage
- **27-inch iMac 3.4GHz**
  - Magic Trackpad
  - 16GB memory upgrade (two 8GB)
  - 32GB memory upgrade (four 8GB)
  - 3TB hard drive
  - 1TB or 3TB Fusion Drive
  - 256GB, 512GB, or 1TB of flash storage
  - 3.5GHz quad-core Intel Core i7 (Turbo Boost up to 3.9GHz) with 8MB L3 cache
  - NVIDIA GeForce GTX 780M graphics processor with 4GB of GDDR5 memory

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact.

**iMac is designed with the following features to reduce its environmental impact:**

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>4</sup>
- Mercury-free LED-backlit display
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR Version 5.2 requirements
- Rated EPEAT Gold<sup>5</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling



# 688\_iMac (27-inch, Late 2013) - Technical Specifications.pdf

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your Mac.](#)

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	3.2GHz	3.4GHz	3.2GHz	3.4GHz
Idle	2.9	3.0	15	15
Hard drive accessing	2.9	3.0	15	15
CD drive accessing	N/A	N/A	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Pro X
- Final Cut Pro X

### Adapters

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort and Wireless

- AirPort Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station

### Other Accessories

- Magic Trackpad
- Apple USB SuperDrive
- Apple Battery Charger
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Based on an IEEE 802.11ac draft specification.
  3. Weight varies by configuration and manufacturing process.
  4. PVC-free AC power cord available in all regions except South Korea.
  5. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Nov 1, 2017

# iMac (27-inch, Mid 2011) - Technical Specifications

## Display

- 27-inch (viewable) LED-backlit glossy widescreen TFT display with support for millions of colors
- Resolution: 2560 by 1440 pixels

## Processor

- 2.7GHz quad-core Intel Core i5 with 6MB on-chip shared L3 cache
- 3.1GHz quad-core Intel Core i5 with 6MB on-chip shared L3 cache  
*Configurable to 3.4GHz quad-core Intel Core i7, only at the Apple Online Store.*

## Memory

4GB (two 2GB) of 1333MHz DDR3 memory

*Configurable to 16GB, only at the Apple Online Store.*

## Storage<sup>1</sup>

- **2.7 GHz**  
1TB (7200 rpm) hard drive  
*Configurable to 2TB hard drive or 256GB solid-state second drive, only at the Apple Online Store.*
- **3.1 GHz**  
1TB (7200 rpm) hard drive  
*Configurable to 2TB hard drive or 256GB solid-state second drive, only at the Apple Online Store.*

## Graphics

- **2.7 GHz**  
AMD Radeon HD 6770M graphics processor with 512MB of GDDR5 memory
- **3.1 GHz**  
AMD Radeon HD 6970M graphics processor with 1GB of GDDR5 memory  
*Configurable to AMD Radeon HD 6970M with 2GB GDDR5, only at the Apple Online Store.*

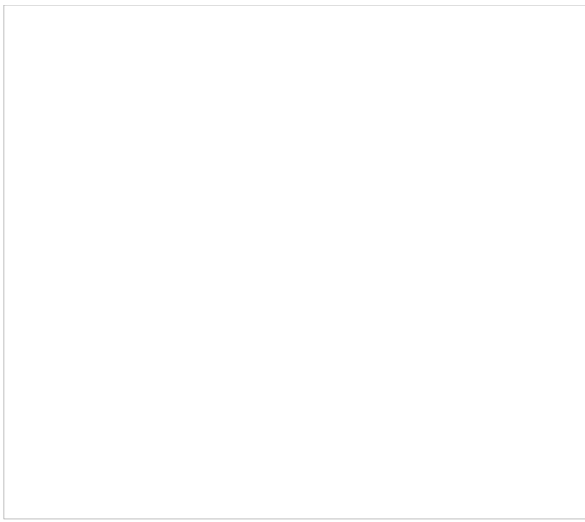
## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display
- Support for extended desktop and video mirroring modes

## Audio

- Built-in stereo speakers
- Two internal 17-watt high-efficiency amplifiers
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone
- Support for Apple iPhone headset with microphone

## Connections and Expansion



- Two Thunderbolt ports
- Mini DisplayPort output with support for DVI, VGA, and dual-link DVI (adapters sold separately)
- One FireWire 800 port; 7 watts
- Four USB 2.0 ports
- SDXC card slot
- Slot-loading 8x SuperDrive with 4x double-layer burning (DVD±R DL/DVD±RW/CD-RW)
- Audio in/out
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- IR receiver

## Input

- **Apple Wireless Keyboard**  
Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement), and embedded numeric keypad
- **Magic Mouse**  
Smooth, seamless Multi-Touch surface with support for simple gestures (scrolling and swiping). Click and double-click anywhere. Ambidextrous construction accommodates left- and right-handed users.
- **Magic Trackpad**  
Solid-state scrolling trackpad for precise cursor control; supports inertial scrolling, pinch and expand, swipe, three-finger swipe, four-finger swipe, tap, double-tap, rotate, screen zoom, scroll, click and drag, click drag and lock, secondary click A and B

## Wireless

- **Wi-Fi**  
802.11n Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g compatible
- **Bluetooth**  
Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology

## Size and Weight

- Height: 20.4 inches (51.7 cm)
- Width: 25.6 inches (65.0 cm)
- Depth: 8.15 inches (20.7 cm)
- Weight: 30.5 pounds (13.8 kg)<sup>3</sup>

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 310W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -4° to 116° F (-20° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- Typical acoustical performance
  - Sound pressure level (operator position): 18 dBA at idle<sup>4</sup>

## Limited Warranty and Service

# 689\_iMac (27-inch, Mid 2011) - Technical Specifications.pdf

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple support](#) or call 800-823-2775.

## Environmental Status Report

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Mercury-free LED-backlit display
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR 5.2 requirements
- Rated EPEAT Gold<sup>6</sup>

## Apple and the Global Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. [The Apple Product Environmental Specification](#) details the environmental attributes of our products.

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	2.7 GHz	3.1 GHz	2.7 GHz	3.1 GHz
Idle	3.0	3.1	16	17
Hard drive accessing	3.0	3.1	16	18
CD drive accessing	no value	3.4	no value	22

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## In the Box

- iMac
- Apple Wireless Keyboard
- Apple Magic Mouse
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

## Included Software

### OS X Lion

Includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more.

### iLife

Includes iPhoto, iMovie, and GarageBand.

## Configurable Options

Purchase from the Apple Online Store to upgrade processor, graphics, memory, and hard drive, or to swap Magic Mouse for Magic Trackpad.

- **2.7 GHz**
  - ■ Magic Trackpad

# 689\_iMac (27-inch, Mid 2011) - Technical Specifications.pdf

- 8GB memory upgrade (two 4GB)
- 16GB memory upgrade (four 4GB)
- 2TB hard drive
- 256GB solid-state second drive

- **3.1 GHz**

- - Magic Trackpad
  - 8GB memory upgrade (two 4GB)
  - 16GB memory upgrade (four 4GB)
  - 2TB hard drive
  - 256GB solid-state second drive
  - 3.4GHz quad-core Intel Core i7
  - AMD Radeon HD 6970M with 2GB of GDDR5 memory

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Express
- Final Cut Express

### Displays and Graphics

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort and Wireless

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station

### Other Accessories

- Magic Trackpad
- Apple Battery Charger
- VESA Mount Adapter Kit
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. Weight varies by configuration and manufacturing process.
  4. Acoustics measured on standard 27-inch iMac systems. Acoustics may vary by configuration.
  5. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  6. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 21, 2013

# iBook G4 (Late 2004) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iBook G4 (Late 2004) - Technical Specifications

Configurations	12-inch Combo Drive	14-inch Combo Drive	14-inch SuperDrive
Model	M9623LL/A	M9627LL/A	M9628LL/A
Processor	1.2GHz PowerPC G4	1.33GHz PowerPC G4	
Level 2 Cache	512K at 1.2GHz	512K at 1.33GHz	
System bus	133MHz		
Memory (DDR SDRAM)	256MB PC2100 (266MHz); supports up to 1.25GB; 1 available expansion slot		
Hard drive <sup>(2)</sup>	30GB ATA/100 4200 rpm	60GB ATA/100 4200 rpm	
Optical drive	Slot-Load Combo Drive (DVD/CD-RW)	Slot-Load Combo Drive (DVD/CD-RW)	Slot-Load SuperDrive (DVD-R/CD-RW)
Display	12.1-inch (diagonal) TFT XGA	14.1-inch (diagonal) TFT XGA	
Graphics support	ATI Mobility Radeon 9200 with 32MB of DDR SDRAM		
FireWire	One FireWire 400 port at up to 400 Mbps		
USB	Two USB 2.0 ports at up to 480 Mbps each		
VGA, S-video and composite video output	Video mirroring supports VGA video out to an external display or projector (requires included Apple VGA Video Adapter) and S-video and composite video out to a TV or VCR (requires optional Apple Video Adapter, sold separately).		
Modem <sup>(3)</sup>	Built-in 56K V.92 modem		
Ethernet	Built-in 10/100BASE-T Ethernet		
Wireless support <sup>(4)</sup>	AirPort Extreme built-in; optional internal Bluetooth module available		
System software	Mac OS X version 10.3 Panther		
Software	All models include Mac OS X, Classic environment, Mail, iChat AV, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie, iDVD <sup>(5)</sup> , GarageBand), iSync, iCal, DVD Player, AppleWorks, Mac OS X Chess, Microsoft Internet Explorer, EarthLink (includes 30 days of free dial-up service with activation), Quicken 2005 for Mac, World Book 2004 Edition, Nanosaur 2, Marble Blast Gold, Microsoft Office 2004 for Mac Test Drive, Zinio Reader, Apple Hardware Test		
Service and support	90 days of free telephone support and one-year limited warranty. Product contains documentation. Backup copy of software is provided on CD-ROM.		
Internet access	30 days of free dial-up Internet service with EarthLink (North America only) activation. Internet access requires an Internet service account; fees may apply.		
Hardware accessories	Apple VGA Display Adapter, modem cable, power adapter, AC wall plug, power cord, lithium-ion battery		
Build-to-Order Options	Order a custom-configured iBook from the online <a href="#">Apple Store</a> or an authorized Apple reseller.		
Memory	256MB (512 total), 512MB (768 total), 1GB (1.25 total)		
Hard Drive <sup>(2)</sup>	60GB or 80GB ATA-100 4200RPM		
Wireless	AirPort Extreme Base Station (with modem and antenna port) M8799LL/A AirPort Express Base Station M9470LL/A Internal Bluetooth module D-Link DBT-120 USB Bluetooth Adapter T6295ZM/A		
Adapters and cables	Apple Video Adapter M9109G/A Apple VGA Display Adaptor M8639G/A Apple FireWire Cable (4-pin to 6-pin, 1.8 meter) M8706G/A		
Battery and power	Apple Portable Power Adapter M8943LL/A iBook Rechargeable Battery (12.1-inch iBook with CD-ROM) M9337G/A iBook Rechargeable Battery (14.1-inch iBook) M9338G/A		
Accessories	Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269Z/A Apple Keyboard (White) M9034LL/A Apple Mouse (White) M9035G/A iSight M8817LL/B		
Services	AppleCare Protection Plan M8852LL/A .Mac Subscription M9495Z/A		

### Technical Specifications

#### Processor and memory

# 68\_iBook G4 (Late 2004) - Technical Specifications.pdf

- 1.2GHz or 1.33GHz PowerPC G4 processor with Velocity Engine and 512K on-chip level 2 cache running at 1.2GHz or 1.33GHz
- 133 MHz system bus
- 256MB of PC2100 (266MHz) DDR SDRAM (256MB built-in and one available SO-DIMM slot) with support for up to 1.25GB

## Storage

- 30GB or 60GB Ultra ATA hard disk drive <sup>(2)</sup>
- One of the following optical drives:
  - Combo Drive (DVD-ROM/CD-RW); writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads DVD-ROM discs at up to 8x speed, reads CD-ROM discs at up to 24x speed
  - SuperDrive (DVD-R/CD-RW); writes DVD-R discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 24x speed.
- Support for external FireWire and USB storage devices

## Display

- Choice of built-in 12.1-inch or 14.1-inch (diagonal) TFT XGA active-matrix display
- Support for millions of colors at 1024 x 768 pixel resolution
- Support for resolution scaling to 800 x 600 pixel and 640 x 480 pixel resolution with millions of colors

## Graphics support

- ATI Mobility Radeon 9200 graphics processor with 32MB of dedicated video memory and AGP 4X support

## Communications

- Built-in 56K V.92 modem (RJ-11 connector) <sup>(3)</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and expansion slot for optional 54 Mbps AirPort Extreme Card; (compliant with 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) <sup>(4)</sup>
- Optional Internal Bluetooth module available as a built-to-order option

## Peripheral connections

- Two 480 Mbps USB 2.0 ports
- One FireWire 400 port at up to 400 Mbps <sup>(6)</sup>

## Audio

- 16-bit CD-quality stereo headphone jack
- Built-in stereo speakers
- Built-in microphone
- Support for external USB audio devices such as microphones and speakers

## Video

- VGA video output for video mirroring on an external display or projector (24-bit color) with included Apple VGA Display Adapter.
- S-video and composite video output to TV or projector (requires Apple Video Adapter, sold separately)

## Battery

- iBook G4 with 12.1-inch display: 50-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge <sup>(1)</sup>
- iBook G4 with 14.1-inch display: 61-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge <sup>(1)</sup>
- Integrated charge indicator LEDs on battery

## Keyboard and trackpad

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement) and embedded numeric keypad
- Solid-state trackpad for precise cursor control; supports tap, double-tap and drag capabilities

## Electrical and environmental

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60 Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Size and weight (12.1-inch model)

- Height: 1.35 inches (3.42 cm)
- Width: 11.2 inches (28.5 cm)
- Depth: 9.06 inches (23.0 cm)
- Weight: 4.9 pounds (2.2 kg) <sup>(7)</sup>

# 68\_iBook G4 (Late 2004) - Technical Specifications.pdf

## Size and weight: (14.1-inch model)

- Height: 1.35 inches (3.42 cm)
- Width: 12.7 inches (32.3 cm)
- Depth: 10.2 inches (25.9 cm)
- Weight: 5.9 pounds (2.7 kg) <sup>(7)</sup>

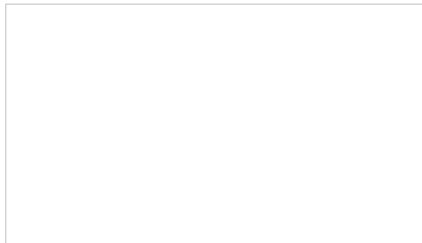
1. Battery life depends on configuration and use.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.
4. Wireless Internet access requires AirPort Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.
5. You need an Apple SuperDrive to burn DVDs in iDVD, but you can save iDVD projects as an archive on iBook G4 models with a Combo Drive and later transfer them to a SuperDrive-equipped system and burn them to a DVD.
6. Actual rates will vary.
7. Weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

Published Date: Apr 6, 2016



# MacBook Pro (Retina, 15-inch, Late 2013) - Technical Specifications



## Display

- Retina display: 15.4-inch (diagonal) LED-backlit display with IPS technology; 2880-by-1800 resolution at 220 pixels per inch with support for millions of colors
- Native resolution: 2880 by 1800 pixels (Retina); scaled resolutions: 1920 by 1200, 1680 by 1050, 1280 by 800, and 1024 by 640 pixels

## Processor

- **2.0GHz**  
2.0GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.2GHz) with 6MB shared L3 cache  
*Configurable to 2.3GHz quad-core Intel Core i7 (Turbo Boost up to 3.5GHz) with 6MB shared L3 cache or 2.6GHz quad-core Intel Core i7 (Turbo Boost up to 3.8GHz) with 6MB shared L3 cache.*
- **2.3GHz**  
2.3GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.5GHz) with 6MB shared L3 cache  
*Configurable to 2.6GHz quad-core Intel Core i7 (Turbo Boost up to 3.8GHz) with 6MB shared L3 cache.*

## Memory

- 8GB of 1600MHz DDR3L onboard memory  
*Configurable to 16GB.*
- 16GB of 1600MHz DDR3L onboard memory

## Storage<sup>1</sup>

- **256GB**  
*Configurable to 512GB or 1TB flash storage.*
- **512GB**  
*Configurable to 1TB flash storage.*

## Size and Weight

- Height: 0.71 inch (1.8 cm)
- Width: 14.13 inches (35.89 cm)
- Depth: 9.73 inches (24.71 cm)
- Weight: 4.46 pounds (2.02 kg)<sup>2</sup>

## Graphics and Video Support

- Intel Iris Pro Graphics
- NVIDIA GeForce GT 750M with 2GB of GDDR5 memory and automatic graphics switching
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on up to two external displays, both at millions of colors
- **Thunderbolt digital video output**
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- **HDMI video output**
  - Support for 1080p resolution at up to 60Hz
  - Support for 3840-by-2160 resolution at 30Hz

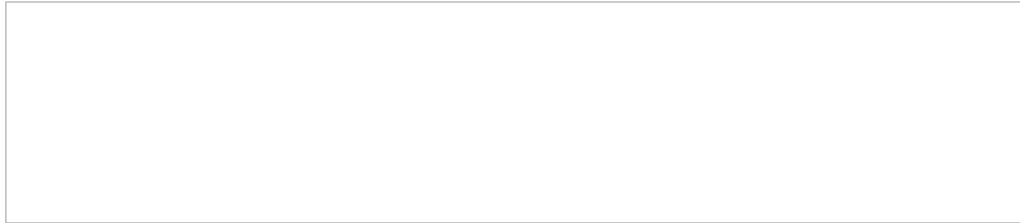
# 690\_MacBook Pro (Retina, 15-inch, Late 2013) - Technical Specifications.pdf

- Support for 4096-by-2160 resolution at 24Hz

## Camera

- 720p FaceTime HD camera

## Connections and Expansion



- MagSafe 2 power port
- Two Thunderbolt 2 ports (up to 20 Gbps)
- Two USB 3 ports (up to 5 Gbps)
- HDMI port
- Headphone port
- SDXC card slot
- Apple Thunderbolt to FireWire Adapter (sold separately)
- Apple Thunderbolt to Gigabit Ethernet Adapter (sold separately)

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Support for Apple iPhone headset with remote and microphone
  - Support for audio line out (digital/analog)

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted "T" arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 8 hours wireless web
- Up to 8 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 95-watt-hour lithium-polymer battery
- 85W MagSafe 2 Power Adapter with cable management system; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

**OS X Mavericks:** Easy to use, incredibly powerful, and packed with features you'll love, OS X Mavericks is the world's most advanced desktop operating system. [Learn more](#)

OS X Mavericks Includes:

- AirDrop
- AirPlay
- Dictation
- Gatekeeper
- Notification Center
- Facebook Integration
- Twitter Integration
- Multiple Display Support
- Finder Tabs and Tags
- iCloud
- iCloud Keychain
- Dashboard
- Mission Control
- Spotlight Search
- Safari Power Saver
- App Nap
- Power Nap
- Compressed Memory
- Built-in Sharing

## Built-in Apps<sup>5</sup>

- iPhoto
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Maps
- iBooks
- Safari
- Mail
- FaceTime
- Messages
- Calendar
- Contacts
- Reminders
- Time Machine
- Photo Booth
- iTunes
- Game Center
- Preview
- Notes
- Mac App Store

## Limited Warranty and Service

Your MacBook Pro with Retina display comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Pro with Retina display
- MagSafe 2 Power Adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Pro to order with these options, only at the [Apple Online Store](#):

- Up to 2.6GHz quad-core Intel Core i7 (Turbo Boost up to 3.8GHz) with 6MB shared L3 cache
- Up to 16GB memory upgrade
- Up to 1TB of flash storage<sup>1</sup>

## MacBook Pro with Retina Display and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**MacBook Pro with Retina display is designed with the following features to reduce its environmental impact:**

- Highly recyclable aluminum enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>6</sup>
- Reduced packaging volume
- Meets ENERGY STAR Version 6 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level $L_{WAd}$ (B) 1 B = 10 dB		Sound Pressure Level Operator Position $L_{pAm}$ (dB)	
	2.0GHz	2.3GHz	2.0GHz	2.3GHz
Idle	2.5	2.5	8.0	7.0
Hard drive accessing	N/A	N/A	N/A	N/A
CD drive accessing	N/A	N/A	N/A	N/A

1.  $L_{WAd}$  is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2.  $L_{pAm}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- Aperture
- Logic Pro X
- Final Cut Pro X

### Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

### AirPort and Wireless

- AirPort Express

# 690\_MacBook Pro (Retina, 15-inch, Late 2013) - Technical Specifications.pdf

- AirPort Extreme
- AirPort Time Capsule

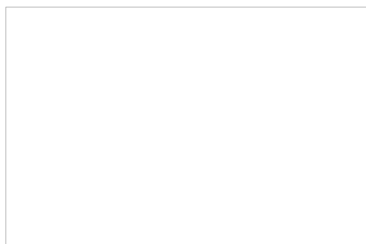
## Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 60W MagSafe 2 Power Adapter
- 85W MagSafe 2 Power Adapter
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Requires Internet access. 802.11ac is based on an IEEE draft specification.
  4. Testing conducted by Apple in October 2013 using preproduction 2.3GHz quad-core Intel Core i7–based 15-inch MacBook Pro units, preproduction 2.0GHz quad-core Intel Core i7–based 15-inch MacBook Pro units and preproduction 2.6GHz dual-core Intel Core i5–based 13-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 720p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS X Mavericks required. Downloading apps requires an Apple ID.
  6. PVC-free AC power cord available in all regions except China, India, and South Korea.
  7. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Feb 5, 2018

# MacBook Pro (Retina, 13-inch, Late 2013) - Technical Specifications



## Display

- Retina display: 13.3-inch (diagonal) LED-backlit display with IPS technology; 2560-by-1600 resolution at 227 pixels per inch with support for millions of colors
- Native resolution: 2560 by 1600 pixels (Retina); scaled resolutions: 1680 by 1050, 1440 by 900, and 1024 by 640 pixels

## Processor

- **2.4GHz**  
2.4GHz dual-core Intel Core i5 processor (Turbo Boost up to 2.9GHz) with 3MB shared L3 cache  
*Configurable to 2.6GHz dual-core Intel Core i5 (Turbo Boost up to 3.1GHz) with 3MB shared L3 cache or 2.8GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 4MB shared L3 cache.*
- **2.6GHz**  
2.6GHz dual-core Intel Core i5 processor (Turbo Boost up to 3.1GHz) with 3MB shared L3 cache  
*Configurable to 2.8GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 4MB shared L3 cache.*

## Memory

- **2.4GHz - 128GB**  
4GB of 1600MHz DDR3L onboard memory  
*Configurable to 8GB or 16GB.*
- **2.4GHz - 256GB**  
8GB of 1600MHz DDR3L onboard memory  
*Configurable to 16GB.*
- **2.6GHz - 512GB**  
8GB of 1600MHz DDR3L onboard memory  
*Configurable to 16GB.*

## Storage<sup>1</sup>

- **2.4GHz**
  - 128GB
  - 256GB
- **2.6GHz**
  - 512GB*Configurable to 1TB flash storage.*

## Size and Weight

- Height: 0.71 inch (1.8 cm)
- Width: 12.35 inches (31.4 cm)
- Depth: 8.62 inches (21.9 cm)
- Weight: 3.46 pounds (1.57 kg)<sup>2</sup>

## Graphics and Video Support

- Intel Iris Graphics
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on up to two external displays, both at millions of colors
- **Thunderbolt digital video output**
  - Native Mini DisplayPort output

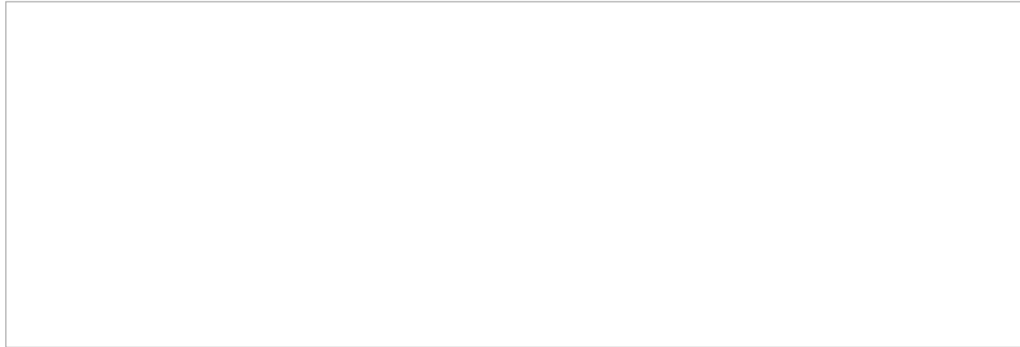
# 691\_MacBook Pro (Retina, 13-inch, Late 2013) - Technical Specifications.pdf

- DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- **HDMI video output**
    - Support for 1080p resolution at up to 60Hz
    - Support for 3840-by-2160 resolution at 30Hz
    - Support for 4096-by-2160 resolution at 24Hz

## Camera

- 720p FaceTime HD camera

## Connections and Expansion



- MagSafe 2 power port
- Two Thunderbolt 2 ports (up to 20 Gbps)
- Two USB 3 ports (up to 5 Gbps)
- HDMI port
- Headphone port
- SDXC card slot
- Apple Thunderbolt to FireWire Adapter (sold separately)
- Apple Thunderbolt to Gigabit Ethernet Adapter (sold separately)

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Support for Apple iPhone headset with remote and microphone
  - Support for audio line out (digital/analog)

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted "T" arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 9 hours wireless web
- Up to 9 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 71.8-watt-hour lithium-polymer battery
- 60W MagSafe 2 Power Adapter with cable management system; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

**OS X Mavericks:** Easy to use, incredibly powerful, and packed with features you'll love, OS X Mavericks is the world's most advanced desktop operating system. [Learn more](#)

### OS X Mavericks Includes:

- AirDrop
- AirPlay
- Dictation
- Gatekeeper
- Notification Center
- Facebook Integration
- Twitter Integration
- Multiple Display Support
- Finder Tabs and Tags
- iCloud
- iCloud Keychain
- Dashboard
- Mission Control
- Spotlight Search
- Safari Power Saver
- App Nap
- Power Nap
- Compressed Memory
- Built-in Sharing

## Built-in Apps<sup>5</sup>

- iPhoto
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Maps
- iBooks
- Safari
- Mail
- FaceTime
- Messages
- Calendar
- Contacts
- Reminders
- Time Machine
- Photo Booth
- iTunes
- Game Center
- Preview
- Notes
- Mac App Store

## Limited Warranty and Service



# 691\_MacBook Pro (Retina, 13-inch, Late 2013) - Technical Specifications.pdf

Your MacBook Pro with Retina display comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Pro with Retina display
- MagSafe 2 Power Adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Pro to order with these options, only at the [Apple Online Store](#):

- Up to 2.8GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 4MB shared L3 cache
- Up to 16GB memory upgrade
- Up to 1TB of flash storage<sup>1</sup>

## MacBook Pro with Retina Display and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**MacBook Pro with Retina display is designed with the following features to reduce its environmental impact:**

- Highly recyclable aluminum enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>6</sup>
- Reduced packaging volume
- Meets ENERGY STAR Version 6 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	2.4GHz	2.6GHz	2.4GHz	2.6GHz
Idle	2.5	2.5	6.0	5.0
Hard drive accessing	N/A	N/A	N/A	N/A
CD drive accessing	N/A	N/A	N/A	N/A

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

## Accessories

### Mac Software

- Aperture
- Logic Pro X

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- Final Cut Pro X

## Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

## AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

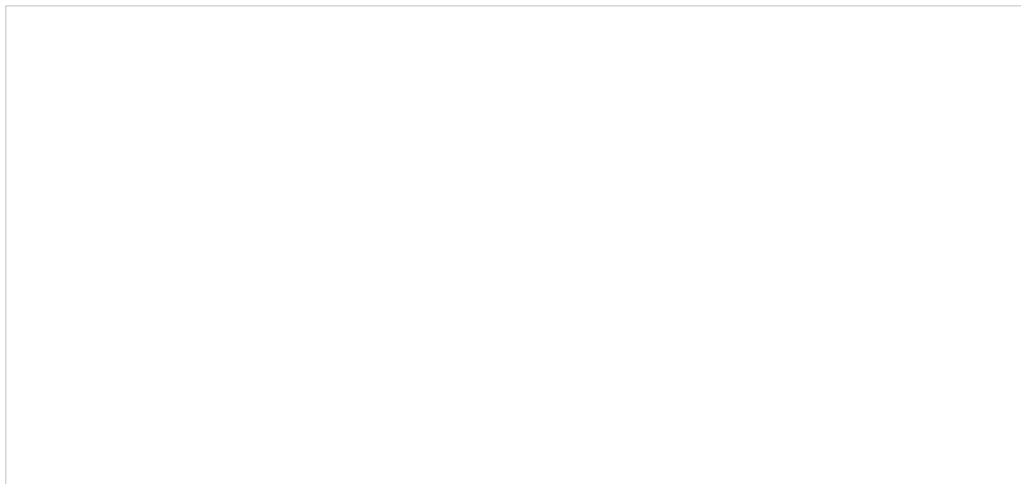
## Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 60W MagSafe 2 Power Adapter
- 85W MagSafe 2 Power Adapter
- AppleCare Protection Plan

- 
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  2. Weight varies by configuration and manufacturing process.
  3. Requires Internet access. 802.11ac is based on an IEEE draft specification.
  4. Testing conducted by Apple in October 2013 using preproduction 2.3GHz quad-core Intel Core i7–based 15-inch MacBook Pro units, preproduction 2.0GHz quad-core Intel Core i7–based 15-inch MacBook Pro units and preproduction 2.6GHz dual-core Intel Core i5–based 13-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 720p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS X Mavericks required. Downloading apps requires an Apple ID.
  6. PVC-free AC power cord available in all regions except China, India, and South Korea.
  7. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 13, 2016

# iPad Air - Technical Specifications



## Finish

- Space Gray
- Silver

## Models

- Wi-Fi
- Wi-Fi + Cellular

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB
- 128GB

## Size and Weight<sup>2</sup>

- **Wi-Fi**
  - Height: 9.4 inches (240 mm)
  - Width: 6.6 inches (169.5 mm)
  - Depth: 0.29 inch (7.5 mm)
  - Weight: 1 pounds (469 g)
- **Wi-Fi + Cellular**
  - Height: 9.4 inches (240 mm)
  - Width: 6.6 inches (169.5 mm)
  - Depth: 0.29 inch (7.5 mm)
  - Weight: 1.05 pounds (478 g)

## Display

- Retina display
- 9.7-inch (diagonal) LED-backlit Multi-Touch display with IPS technology
- 2048-by-1536 resolution at 264 pixels per inch (ppi)
- Fingerprint-resistant oleophobic coating

## Chip

- A7 chip with 64-bit architecture and M7 motion coprocessor

## Wireless and Cellular

- **Wi-Fi**
  - Wi-Fi (802.11a/b/g/n); dual channel (2.4GHz and 5GHz) and MIMO

# 692\_iPad Air - Technical Specifications.pdf

- Bluetooth 4.0 technology
- **Wi-Fi + Cellular**
  - Wi-Fi (802.11a/b/g/n); dual channel (2.4GHz and 5GHz) and MIMO
  - Bluetooth 4.0 technology
  - UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
  - CDMA EV-DO Rev. A and Rev. B (800, 1900 MHz)
  - LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26)<sup>3</sup>
  - Data only<sup>4</sup>

## Cameras, Photos, and Video Recording

- **FaceTime HD Camera**
  - 1.2MP photos
  - 720p HD video
  - FaceTime video calling over Wi-Fi or cellular<sup>5</sup>
  - Face detection
  - Backside illumination
  - Tap to control exposure for video or still images
  - Photo and video geotagging
- **Video Recording**
  - 1080p HD video recording
  - Video stabilization
  - Face detection
  - Tap to focus while recording
  - Backside illumination
  - 3x video zoom
- **iSight Camera**
  - 5MP photos
  - Autofocus
  - Face detection
  - Backside illumination
  - Five-element lens
  - Hybrid IR filter
  - *f*/2.4 aperture
  - Tap to focus video or still images
  - Tap to control exposure for video or still images
  - Photo and video geotagging
  - HDR photos

## External Buttons and Connectors

- **External Buttons and Controls**
  - Home
  - On/Off; Sleep/Wake
  - Silent/Screen rotation lock
  - Volume up/down
- **Connectors and Input/Output**
  - Dual Microphones
  - 3.5-mm stereo headphone minijack
  - Lightning connector
  - Built-in speakers

## Power and Battery<sup>6</sup>

- **Wi-Fi**
  - Built-in 32.4-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- **Wi-Fi + Cellular**
  - Built-in 32.4-watt-hour rechargeable lithium-polymer battery

# 692\_iPad Air - Technical Specifications.pdf

- Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
- Up to 9 hours of surfing the web using cellular data network
- Charging via power adapter or USB to computer system

## Input/Output

- **Wi-Fi**
  - 3.5-mm stereo headphone minijack
  - Built-in speakers
  - Dual microphones
- **Wi-Fi + Cellular**
  - 3.5-mm stereo headphone minijack
  - Built-in speakers
  - Dual microphones
  - Nano-SIM card tray

## Connector

- Lightning

## Sensors

- Three-axis gyro
- Accelerometer
- Ambient light sensor

## Operating system

### iOS 9

With an all-new design and all-new features, iOS 9 is the world's most advanced mobile OS. In its most advanced form. [Learn more about iOS 9](#)

### iOS 9 includes:

- AirDrop
- AirPlay
- AirPrint
- Control Center
- Notification Center
- Siri
- Spotlight Search
- Apple Music
- Family Sharing
- iCloud Drive
- Multitasking
- QuickType Keyboard

## Built-in Apps

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- Contacts
- iBooks
- Game Center
- Reminders

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- Clock
- Videos
- Photo Booth
- Podcasts
- News
- Find My iPhone
- Find My Friends
- iCloud Drive

## Free Apps from Apple<sup>7</sup>

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Apple Store
- Trailers
- Remote

## Location

- **Wi-Fi**
  - Wi-Fi
  - Digital compass
- **Wi-Fi + Cellular**
  - Wi-Fi
  - Digital compass
  - Assisted GPS and GLONASS
  - Cellular

## Video Calling<sup>5</sup>

- **Wi-Fi**
  - FaceTime
  - iPad Air to any FaceTime-enabled device over Wi-Fi
- **Wi-Fi + Cellular**
  - FaceTime
  - iPad Air to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Calling<sup>5</sup>

- **Wi-Fi**
  - FaceTime
  - iPad Air to any FaceTime-enabled device over Wi-Fi
- **Wi-Fi + Cellular**
  - FaceTime
  - iPad Air to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)

# 692\_iPad Air - Technical Specifications.pdf

- Video formats supported: H.264 video up to 1080p, 60 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- **Viewable document types:**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## Languages

- **Language support**  
English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **Keyboard support**  
English (U.S.), English (Canadian), English (UK), English (Australian), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Tamil, Thai, Tibetan, Turkish, Ukrainian, Vietnamese
- **Dictionary support (enables predictive text and autocorrect)**  
English (U.S.), English (Canadian), English (UK), English (Australian), Chinese (Simplified), Chinese (Traditional), French, French (Canadian), French (Switzerland), German, Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Indonesian, Latvian, Lithuanian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Tamil, Thai, Turkish, Ukrainian, Vietnamese
- **Siri languages**  
English (U.S., UK, Canada, Australia), Spanish (U.S., Mexico, Spain), French (France, Canada, Switzerland), German (Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong)

## Intelligent Assistant<sup>8</sup>

- [Siri](#)  
Use your voice to send messages, set reminders, and more.

## Accessibility

- VoiceOver screen reader
- Guided Access
- Switch Control
- Support for playback of closed-captioned content
- AssistiveTouch
- Full-screen zoom magnification
- Larger type
- Bold text
- Increase contrast
- Reduce motion
- On/Off labels
- Invert colors
- Left/right volume adjustment

## Environmental Requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## System Requirements

- Apple ID (required for some features)

- Internet access<sup>9</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X v10.6.8 or later
  - PC: Windows 8; Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
  - iTunes (free download from [www.itunes.com/download](http://www.itunes.com/download))

## In the Box

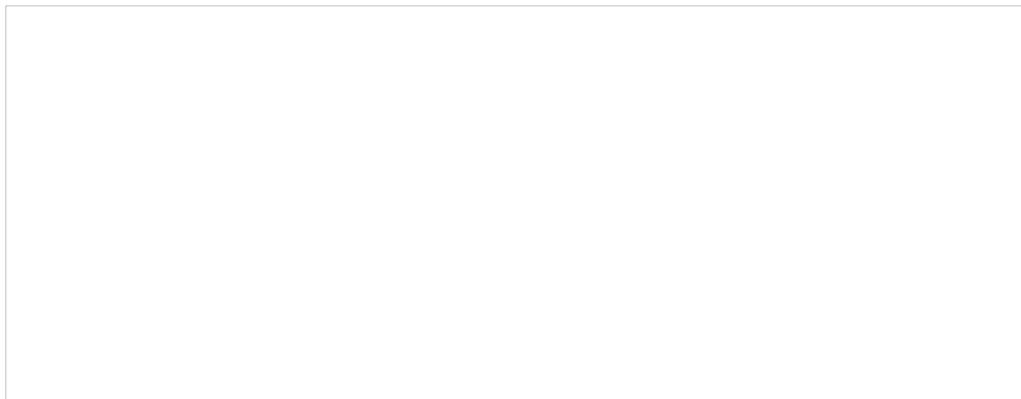
- iPad Air
- Lightning to USB Cable
- USB Power Adapter

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Size and weight vary by configuration and manufacturing process.
  3. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).
  4. Cellular data service is available only on Wi-Fi + Cellular models. The model you purchase is configured to work with a particular cellular network technology. Data plan required.
  5. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
  6. Testing conducted by Apple in October 2013 using preproduction iPad Air units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.
  7. iMovie, Pages, Numbers, and Keynote are free on the App Store for qualifying iOS 9 compatible devices with initial activation on or after September 1, 2013. GarageBand is free on the App Store for qualifying iOS 9 compatible devices with initial activation on or after September 1, 2014. See [www.apple.com/ios/whats-new](http://www.apple.com/ios/whats-new) for iOS 9 compatible devices. Downloading apps requires an Apple ID.
  8. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
  9. Wireless broadband recommended; fees may apply.

Published Date: Nov 1, 2017



# iPad mini 2 with Retina display - Technical Specifications



## Finish

- Space Gray
- Silver

## Models

- Wi-Fi
- Wi-Fi + Cellular

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB
- 128GB

## Size and Weight<sup>2</sup>

- **Wi-Fi**
  - Height: 7.87 inches (200 mm)
  - Width: 5.3 inches (134.7 mm)
  - Depth: 0.29 inch (7.5 mm)
  - Weight: 0.73 pound (331 g)
- **Wi-Fi + Cellular**
  - Height: 7.87 inches (200 mm)
  - Width: 5.3 inches (134.7 mm)
  - Depth: 0.29 inch (7.5 mm)
  - Weight: 0.75 pound (341 g)

## Display

- Retina display
- 7.9-inch (diagonal) LED-backlit Multi-Touch display with IPS technology
- 2048-by-1536 resolution at 326 pixels per inch (ppi)
- Fingerprint-resistant oleophobic coating

## Chip

- A7 chip with 64-bit architecture and M7 motion coprocessor

## Wireless and Cellular

- **Wi-Fi**
  - Wi-Fi (802.11a/b/g/n); dual channel (2.4GHz and 5GHz) and MIMO
  - Bluetooth 4.0 technology
- **Wi-Fi + Cellular**
  - Wi-Fi (802.11a/b/g/n); dual channel (2.4GHz and 5GHz) and MIMO

# 693\_iPad mini 2 with Retina display - Technical Specifications.pdf

- Bluetooth 4.0 technology
- UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
- CDMA EV-DO Rev. A and Rev. B (800, 1900 MHz)
- Data plan required. LTE is available in select markets and through select carriers. Speeds will vary based on site conditions. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE). (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26)<sup>3</sup>
- Data only<sup>4</sup>

## Cameras, Photos, and Video Recording

- **iSight Camera**
  - 5MP photos
  - Autofocus
  - Face detection
  - Backside illumination
  - Five-element lens
  - Hybrid IR filter
  - *f*/2.4 aperture
  - Tap to focus video
  - or still images
  - Tap to control exposure for video or still images
  - Photo and video geotagging
  - HDR photos
  - Panorama
- **Video Recording**
  - 1080p HD video recording
  - Video stabilization
  - Face detection
  - Tap to focus while recording
  - Backside illumination
  - 3x video zoom
  - Time-lapse video
- **FaceTime HD Camera**
  - 1.2MP photos
  - 720p HD video
  - Face detection
  - Backside illumination
  - Tap to control exposure for video or still images
  - Photo and video geotagging

## External Buttons and Connectors

- **External Buttons and Controls**
  - Home
  - Volume up/down
  - Silent/Screen rotation lock
  - On/Off- Sleep/Wake
- **Connectors and Input/Output**
  - Dual microphones
  - 3.5-mm stereo headphone minijack
  - Lightning connector
  - Built-in speakers

## Battery and Power<sup>6</sup>

- **Wi-Fi**
  - Built-in 23.8-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- **Wi-Fi + Cellular**
  - Built-in 23.8-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Up to 9 hours of surfing the web using cellular data network
  - Charging via power adapter or USB to computer system

## Input/Output

- **Wi-Fi**
  - 3.5-mm stereo headphone minijack
  - Built-in speakers
  - Dual microphones
- **Wi-Fi + Cellular**
  - 3.5-mm stereo headphone minijack
  - Built-in speakers
  - Dual microphones
  - Nano-SIM card tray

## Connector

- Lightning

## Sensors

- Three-axis gyro
- Accelerometer
- Ambient light sensor

## Operating System

### iOS 9

With an all-new design and all-new features, iOS 9 is the world's most advanced mobile OS. In its most advanced form. [Learn more about iOS 9](#)

### iOS 9 includes:

- AirDrop
- AirPlay
- AirPrint
- Control Center
- Notification Center
- Siri
- Spotlight Search
- Apple Music
- Family Sharing
- iCloud Drive
- Multitasking
- QuickType Keyboard

## Built-in Apps

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- Contacts
- iBooks
- Game Center
- Reminders
- Clock
- Videos
- Photo Booth
- Podcasts
- News

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- Find My iPhone
- Find My Friends
- iCloud Drive

## Free Apps from Apple<sup>7</sup>

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Apple Store
- Trailers
- Remote

## Location

- **Wi-Fi**
  - Wi-Fi
  - Digital compass
- **Wi-Fi + Cellular**
  - Wi-Fi
  - Digital compass
  - Assisted GPS and GLONASS
  - Cellular

## Video Calling<sup>5</sup>

- **Wi-Fi**
  - FaceTime
  - iPad mini to any FaceTime-enabled device over Wi-Fi
- **Wi-Fi + Cellular**
  - FaceTime
  - iPad mini to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Calling<sup>5</sup>

- **Wi-Fi**
  - FaceTime
  - iPad mini to any FaceTime-enabled device over Wi-Fi
- **Wi-Fi + Cellular**
  - FaceTime
  - iPad mini to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay mirroring and video out to Apple TV (2nd and 3rd generation)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 1080p, 60 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- **Viewable document types**

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.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## Languages

- **Language support**

English (U.S.), English (UK), Chinese (Simplified), Chinese (Traditional), French, German, Italian, Japanese, Korean, Spanish, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Keyboard support**

English (U.S.), English (Canadian), English (UK), English (Australian), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Handwriting, Pinyin, Zhuyin, Cangjie, Stroke), French, French (Canadian), French (Switzerland), German (Germany), German (Switzerland), Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Serbian (Cyrillic/Latin), Slovak, Swedish, Tamil, Thai, Tibetan, Turkish, Ukrainian, Vietnamese

- **Dictionary support (enables predictive text and autocorrect)**

English (U.S.), English (Canadian), English (UK), English (Australian), Chinese (Simplified), Chinese (Traditional), French, French (Canadian), French (Switzerland), German, Italian, Japanese (Romaji, Kana), Korean, Spanish, Arabic, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Estonian, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Indonesian, Latvian, Lithuanian, Malay, Norwegian, Polish, Portuguese, Portuguese (Brazil), Romanian, Russian, Slovak, Swedish, Tamil, Thai, Turkish, Ukrainian, Vietnamese

- **Siri languages**

English (U.S., UK, Canada, Australia), Spanish (U.S., Mexico, Spain), French (France, Canada, Switzerland), German (Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong)

## Intelligent Assistant<sup>8</sup>

- Siri
- Use your voice to send messages, set reminders, and more
- Use hands-free
- Listen to and identify songs

[Learn more about Siri](#)

## Accessibility

- VoiceOver screen reader
- Guided Access
- Switch Control
- Support for playback of closed-captioned content
- AssistiveTouch
- Full-screen zoom magnification
- Larger type
- Bold text
- Increase contrast
- Reduce motion
- On/Off labels
- Invert colors
- Left/right volume adjustment

## Environmental Requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>9</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X v10.6.8 or later
  - PC: Windows 8; Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later

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- iTunes (free download from [www.itunes.com/download](http://www.itunes.com/download))

## In the Box

- iPad mini 2
- Lightning to USB Cable
- USB Power Adapter

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Size and weight vary by configuration and manufacturing process.
  3. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).
  4. Cellular data service is available only on Wi-Fi + Cellular models. The model you purchase is configured to work with a particular cellular network technology. Data plan required.
  5. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
  6. Testing conducted by Apple in October 2013 using preproduction iPad mini 2 units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.
  7. iMovie, Pages, Numbers, and Keynote are free on the App Store for qualifying iOS 9 compatible devices with initial activation on or after September 1, 2013. GarageBand is free on the App Store for qualifying iOS 9 compatible devices with initial activation on or after September 1, 2014. See [www.apple.com/ios/whats-new](http://www.apple.com/ios/whats-new) for iOS 9 compatible devices. Downloading apps requires an Apple ID.
  8. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
  9. Wireless broadband recommended; fees may apply.

Published Date: Nov 1, 2017

# MacBook Pro (15-inch, Mid 2012) - Technical Specifications

## Display

- 15.4-inch (diagonal) LED-backlit glossy or optional antiglare widescreen display with support for millions of colors
- Supported resolutions: 1440 by 900 (native), 1280 by 800, 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio stretched; 720 by 480 pixels at 3:2 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio stretched
- Configurable to 1680-by-1050 high-resolution glossy or antiglare display.

## Processor

- 2.3GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.3GHz) with 6MB L3 cache
- 2.6GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.6GHz) with 6MB L3 cache  
*Configurable to 2.7GHz quad-core Intel Core i7 (Turbo Boost up to 3.7GHz) with 8MB L3 cache.*

## Memory

- **2.3GHz**  
4GB of 1600MHz DDR3 memory  
*Configurable to 8GB.*
- **2.6GHz**  
8GB of 1600MHz DDR3 memory

## Storage<sup>1</sup>

- **2.3GHz**  
500GB 5400-rpm hard drive  
*Configurable options:*
  - 750GB 5400-rpm hard drive
  - 750GB 7200-rpm hard drive
  - 1TB 5400-rpm hard drive
  - 128GB solid-state drive
  - 256GB solid-state drive
  - 512GB solid-state drive
- **2.6GHz**  
750GB 5400-rpm hard drive  
*Configurable options:*
  - 750GB 7200-rpm hard drive
  - 1TB 5400-rpm hard drive
  - 128GB solid-state drive
  - 256GB solid-state drive
  - 512GB solid-state drive

## Size and Weight

- Height: 0.95 inch (2.41 cm)
- Width: 14.35 inches (36.4 cm)
- Depth: 9.82 inches (24.9 cm)
- Weight: 5.6 pounds (2.56 kg)<sup>2</sup>

## Graphics and Video Support

- Intel HD Graphics 4000
- NVIDIA GeForce GT 650M with 512MB of GDDR5 memory (15-inch 2.3GHz configuration) or NVIDIA GeForce GT 650M with 1GB of GDDR5 memory (15-inch 2.6GHz configuration) and automatic graphics switching
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors

## Thunderbolt digital video output

- Native Mini DisplayPort output
- DVI output using Mini DisplayPort to DVI Adapter (sold separately)
- VGA output using Mini DisplayPort to VGA Adapter (sold separately)
- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

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## Camera

- 720p FaceTime HD camera

## Connections and Expansion

- MagSafe power port
- Gigabit Ethernet port
- FireWire 800 port (up to 800 Mbps)
- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt port (up to 10 Gbps)
- Audio line in
- Audio line out
- SDXC card slot
- Kensington lock slot
- 8x SuperDrive

## Wireless

- 802.11n Wi-Fi wireless networking,<sup>3</sup> IEEE 802.11a/b/g compatible
- Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers with subwoofer
- Omnidirectional microphone
- Audio line in (digital/analog)
- Audio line out (digital/analog)
- Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Battery and Power<sup>4</sup>

- Up to 7 hours wireless web
- Built-in 77.5-watt-hour lithium-polymer battery
- 85W MagSafe Power Adapter with cable management system; MagSafe power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 113° F (–24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Included Software OS X Lion

Includes Mail, Address Book, iCal, the Mac App Store, iTunes, Safari, Time Machine, FaceTime, Photo Booth, Mission Control, Launchpad, AirDrop, Resume, Auto Save, Versions, Quick Look, Spotlight, QuickTime, and more.

**OS X Mountain Lion. Coming soon.** Buy a new Mac now and get a free upgrade to the next release of OS X when it arrives this summer.

[Learn more.](#)

## iLife

Includes iPhoto, iMovie, and GarageBand. [Learn more about iLife.](#)

## Limited Warranty and Service

Your MacBook Pro comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to



# 694\_MacBook Pro (15-inch, Mid 2012) - Technical Specifications.pdf

extend your service and support to three years from your computer’s purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

### In the Box

- MacBook Pro
- Display cleaning cloth
- 15-inch: 85W MagSafe Power Adapter, AC wall plug, and power cord
- Printed and electronic documentation

### Configure to Order

Configure your MacBook Pro to order with these options, only at the [Apple Online Store](#):

- 1680-by-1050 high-resolution glossy or antiglare display
- 2.7GHz quad-core Intel Core i7 (Turbo Boost up to 3.7GHz)
- 8GB memory upgrade (two 4GB)
- 750GB 5400-rpm hard drive
- 750GB 7200-rpm hard drive
- 1TB 5400-rpm hard drive
- 128GB, 256GB, or 512GB solid-state drive

### MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more.](#)

### MacBook Pro is designed with the following features to reduce environmental impact:

- Highly recyclable aluminum enclosure
- Mercury-free LED backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Reduced packaging volume
- Meets ENERGY STAR Version 5.2 requirements

### Apple and the Environment

[Learn more](#) about Apple’s dedication to reducing the environmental impact of our products and process. The [Apple Product Environmental Specification](#) details the environmental attributes of our products.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

### Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	15" 2.6 GHz	15" 2.3 GHz	15" 2.6 GHz	15" 2.3 GHz
Idle	2.8	2.8	17	18
Hard drive accessing	2.9	2.9	18	18
CD drive accessing	3.4	3.3	28	24

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).
3. 1 B (bel) = 10 dB (decibel).

### Accessories

### Mac Software

# 694\_MacBook Pro (15-inch, Mid 2012) - Technical Specifications.pdf

- iWork
- Aperture
- Logic Pro
- Final Cut Pro X

## Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA
- Adapter Apple Mini DisplayPort to Dual-Link DVI Adapter

## AirPort and Wireless

- AirPort Extreme Base Station
- AirPort Express Base Station
- Time Capsule
- Apple Remote
- Apple Wireless Keyboard
- Apple Magic Mouse
- Apple Magic Trackpad

## Other Accessories

- 85W MagSafe Power Adapter (15-inch)
- AppleCare Protection Plan

- 
1. 1GB=1 billion bytes; actual formatted capacity less.
  2. Actual weight varies by configuration and manufacturing process.
  3. Wireless Internet access requires a base station or other wireless access point and Internet access; fees may apply. Some ISPs are not currently compatible with AirPort.
  4. Wireless web testing conducted by Apple in May 2012 using preproduction 2.6GHz quad-core Intel Core i7–based 15-inch MacBook Pro units and preproduction 2.9GHz dual-core Intel Core i7–based 13-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 50%. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.

Published Date: Dec 9, 2013

# iMac (27-inch, Mid 2010) - Technical Specifications

## Processor and memory

- 3.2GHz Intel Core i3 processor with 4MB level 3 cache; supports Hyper-Threading  
*3.6GHz Intel Core i5 processor with 4MB level 3 cache; supports Hyper-Threading and Turbo Boost*
- 2.8GHz Quad-Core Intel Core i5 processor with 8MB level 3 cache; supports Turbo Boost  
*2.93GHz Quad-Core Intel Core i7 processor with 8MB level 3 cache; supports Hyper-Threading and Turbo Boost*

4GB (two 2GB SO-DIMMs) of 1333MHz DDR3 SDRAM; four SO-DIMM slots support up to 16GB

## Size and weight

- Height: 20.4 inches (51.7 cm)
- Width: 25.6 inches (65.0 cm)
- Depth: 8.15 inches (20.7 cm)
- Weight: 30.5 pounds (13.8 kg)<sup>1</sup>

## Connections and expansion

- One FireWire 800 port; 7 watts
- Four USB 2.0 ports
- SDXC card slot

## Communications

- AirPort Extreme 802.11n Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g compatible
- Bluetooth 2.1 + EDR (Enhanced Data Rate) wireless technology
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Two internal 17-watt high-efficiency amplifiers
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone
- Support for Apple iPhone headset with microphone

## Environmental Status Report

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>3</sup>
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR 5.0 requirements
- Rated EPEAT Gold<sup>4</sup>

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	27-inch, 3.2 GHz	27-inch, 2.8 GHz	27-inch, 3.2 GHz	27-inch, 2.8 GHz
Idle	3.0	3.0	16	15
Hard drive accessing	3.0	3.0	16	15
CD drive accessing	3.3	4.2	22	31

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).  
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).

# 695\_iMac (27-inch, Mid 2010) - Technical Specifications.pdf

3. 1 B (bel) = 10 dB (decibel).

## Display

- Built-in 27-inch (viewable) LED-backlit glossy widescreen TFT active-matrix liquid crystal display with IPS technology
- Resolution: 2560 by 1440 pixels
- Typical brightness: 375 cd/m<sup>2</sup>
- Can be attached to a wall mount, articulating arm, or other VESA-compliant mounting solution using the optional VESA Mount Adapter Kit
- Millions of colors at all resolutions
- Typical viewing angle: 178° horizontal; 178° vertical
- 16:9 aspect ratio

## Graphics and video support

- **3.2GHz**  
ATI Radeon HD 5670 graphics processor with 512MB of GDDR3 memory
- **2.8GHz**  
ATI Radeon HD 5750 graphics processor with 1GB of GDDR5 memory
- iSight camera
- Mini DisplayPort output with support for DVI, VGA, and dual-link DVI (adapters sold separately); 27-inch models also support input from external DisplayPort sources (adapters sold separately)
- Support for extended desktop and video mirroring modes
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display

## Storage<sup>5</sup>

- 1TB 7200-rpm Serial ATA hard drive  
*Optional 2TB 7200-rpm Serial ATA hard drive*  
*Optional 256GB solid-state drive*

## Optical drive

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
  - Writes DVD+R DL and DVD-R DL discs at up to 4x speed
  - Writes DVD-R and DVD+R discs at up to 8x speed
  - Writes DVD-RW discs at up to 6x speed and DVD+RW discs at up to 8x speed
  - Reads DVDs at up to 8x speed
  - Writes CD-R discs at up to 24x speed
  - Writes CD-RW discs at up to 16x speed
  - Reads CDs at up to 24x speed

## Electrical and operating requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 365W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -4° to 116° F (-20° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- Typical acoustical performance
  - Sound pressure level (operator position): 18 dBA at idle<sup>6</sup>

## What's included

### In the box:

- iMac
- Apple Wireless Keyboard
- Magic Mouse
- Cleaning cloth
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

### Included software:

### Mac OS X Snow Leopard

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Includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools, and more. Learn more about Mac OS X Snow Leopard

## iLife

Includes iPhoto, iMovie, GarageBand, and iWeb. Learn more about iLife

## Accessories

### Mac Software

- iWork
- Aperture
- Logic Express
- Final Cut Express

### Displays and Graphics

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort & Wireless

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station

### Other Accessories

- Magic Trackpad
- Apple Battery Charger
- VESA Mount Adapter Kit
- AppleCare Protection Plan

### Limited warranty and service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.

### Apple and the global environment

Learn more about Apple's dedication to reducing the environmental impact of our products and process. The Apple Product Environmental Specification details the environmental attributes of our products.

### Recycling

Apple takes a holistic view of materials management and waste minimization. Learn more about how to recycle your Mac.

- 
1. Weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. PVC-free AC power cord is available in the U.S., Canada, Mexico, Colombia, El Salvador, Guatemala, Panama, Peru, Puerto Rico, U.S. Virgin Islands, and Venezuela.
  4. iMac achieved a Gold rating from EPEAT in the U.S., Canada, France, Germany, and the UK.
  5. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  6. Acoustics measured on standard 27-inch iMac systems. Acoustics may vary by configuration.

Published Date: Dec 16, 2013

# iMac (27-inch, Late 2009) - Technical Specifications

## Processor and memory

- 3.06GHz Intel Core 2 Duo processor with 3MB shared L2 cache  
*3.33GHz Intel Core 2 Duo processor with 6MB shared L2 cache*
- 2.66GHz quad-core Intel Core i5 processor with 8MB shared L3 cache; Turbo Boost dynamic performance up to 3.2GHz  
2.8GHz quad-core Intel Core i7 processor with 8MB shared L3 cache; Turbo Boost dynamic performance up to 3.46GHz; Hyper-Threading for up to eight virtual cores

4GB (two 2GB SO-DIMMs) of 1066MHz DDR3 SDRAM; four SO-DIMM slots support up to 16GB

## Size and weight

- Height: 20.4 inches (51.7 cm)
- Width: 25.6 inches (65.0 cm)
- Depth: 8.15 inches (20.7 cm)
- Weight: 30.5 pounds (13.8 kg)<sup>1</sup>

## Connections and expansion

- One FireWire 800 port; 7 watts
- Four USB 2.0 ports
- SD card slot

## Communications

- Built-in AirPort Extreme 802.11n Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)

## Audio

- Built-in stereo speakers
- Two internal 17-watt high-efficiency amplifiers
- Headphone/optical digital audio output (minijack)
- Audio line in/optical digital audio input (minijack)
- Built-in microphone
- Support for Apple Stereo Headset with microphone

## Environmental Status Report

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR 5.0 requirements
- Rated EPEAT Gold

## Acoustic Performance

DECLARED NOISE EMISSIONS in accordance with ISO 9296

	Sound Power Level L <sub>WAd</sub> (B) 1 B = 10 dB		Sound Pressure Level Operator Position L <sub>pAm</sub> (dB)	
	27-inch, 3.06 GHz	27-inch, 2.66 GHz	27-inch, 3.06 GHz	27-inch, 2.66 GHz
Idle	3.0	3.0	17	17
Hard drive accessing	3.1	3.0	18	17
CD drive accessing	no value	no value	no value	no value

1. L<sub>WAd</sub> is the statistical upper-limit A-weighted sound power level (rounded to the nearest 0.1 B).  
2. L<sub>pAm</sub> is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest dB).

# 696\_iMac (27-inch, Late 2009) - Technical Specifications.pdf

3. 1 B (bel) = 10 dB (decibel).

## Display

- Built-in 27-inch (viewable) LED-backlit glossy widescreen TFT active-matrix liquid crystal display with IPS technology
- Resolution: 2560 by 1440 pixels
- 16:9 aspect ratio
- Millions of colors at all resolutions
- Typical viewing angle: 178° horizontal; 178° vertical
- Typical brightness: 375 cd/m<sup>2</sup>
- 27-inch model can be attached to a wall mount, articulating arm, or other VESA-compliant mounting solution using the optional VESA Mount Adapter Kit

## Graphics and video support

- **3.06GHz**  
ATI Radeon HD 4670 graphics processor with 256MB of GDDR3 memory  
*ATI Radeon HD 4850 graphics processor with 512MB of GDDR3 memory*
- **2.66GHz**  
ATI Radeon HD 4850 graphics processor with 512MB of GDDR3 memory
- Built-in iSight camera
- Mini DisplayPort output port with support for DVI, VGA, and dual-link DVI (adapters sold separately). 27-inch models also support input from external DisplayPort sources (adapters sold separately).
- Support for extended desktop and video mirroring modes
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display

## Software

- Mac OS X v10.6 Snow Leopard (includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '09 (includes iPhoto, iMovie, iDVD, iWeb, GarageBand)

## Storage<sup>4</sup>

- 1TB 7200-rpm Serial ATA hard drive  
*Optional 2TB 7200-rpm Serial ATA hard drive*

## Optical drive

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
  - Writes DVD+R DL and DVD-R DL discs at up to 4x speed
  - Writes DVD-R and DVD+R discs at up to 8x speed
  - Writes DVD-RW discs at up to 6x speed and DVD+RW discs at up to 8x speed
  - Reads DVDs at up to 8x speed
  - Writes CD-R discs at up to 24x speed
  - Writes CD-RW discs at up to 16x speed
  - Reads CDs at up to 24x speed

## Electrical and operating requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 365W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -4° to 116° F (-20° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- Typical acoustical performance
  - Sound pressure level (operator position): 18 dBA at idle<sup>6</sup>

## What's included

### In the box:

- iMac
- Apple Wireless Keyboard
- Magic Mouse
- Cleaning cloth

# 696\_iMac (27-inch, Late 2009) - Technical Specifications.pdf

- Power cord
- Install/restore DVDs
- Printed and electronic documentation

## Included software:

### Mac OS X Snow Leopard

Includes iTunes, Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools, and more.

### iLife

Includes iPhoto, iMovie, GarageBand, and iWeb.

### Accessories

#### Mac Software

- iWork '09
- Aperture
- Logic Express
- Final Cut Express

#### Displays and Graphics

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

#### AirPort & Wireless

- Time Capsule
- AirPort Express Base Station
- AirPort Extreme Base Station

#### Other Accessories

- VESA Mount Adapter Kit
- AppleCare Protection Plan

- 
1. Weight varies by configuration and manufacturing process.
  2. Wireless Internet access requires a wireless access point and Internet access; fees may apply.
  3. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 256MB.
  4. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  5. PVC-free external cables in North America only.
  6. Acoustics measured on standard 27-inch iMac systems with 3.06GHz Intel Core 2 Duo processors. Acoustics may vary by configuration.

Published Date: Dec 17, 2013



# Mac Pro (Late 2013) - Technical Specifications



## Dimensions

- Height: 9.9 in
- Diameter: 6.6 in
- Weight: 11 lb<sup>1</sup>

## Processor

- **3.7GHz Quad-Core**
  - Intel Xeon E5 with 10MB L3 cache and Turbo Boost up to 3.9GHz  
*Configurable to 3.5GHz 6-core processor with 12MB L3 cache, 3.0GHz 8-core processor with 25MB L3 cache, or 2.7GHz 12-core processor with 30MB L3 cache*
- **3.5GHz 6-Core**
  - Intel Xeon E5 with 12MB L3 cache and Turbo Boost up to 3.9GHz  
*Configurable to 3.0GHz 8-core processor with 25MB L3 cache or 2.7GHz 12-core processor with 30MB L3 cache*
- **3.0GHz 8-Core**
  - Intel Xeon E5 with 25MB L3 cache and Turbo Boost up to 3.9GHz  
*Configurable to 2.7GHz 12-core processor with 30MB L3 cache*

## Memory

- **3.7GHz Quad-Core**
  - 12GB (three 4GB) of 1866MHz DDR3 ECC memory  
*Configurable to 16GB (four 4GB), 32GB (four 8GB) or 64GB (four 16GB)*
- **3.5GHz 6-Core**
  - 16GB (four 4GB) of 1866MHz DDR3 ECC memory  
*Configurable to 32GB (four 8GB) or 64GB (four 16GB)*
- **3.0GHz 8-Core**
  - 16GB (four 4GB) of 1866MHz DDR3 ECC memory  
*Configurable to 32GB (four 8GB) or 64GB (four 16GB)*

## Graphics

- **3.7GHz Quad-Core**
  - Dual AMD FirePro D300 graphics processors with 2GB of GDDR5 VRAM each
    - 1280 stream processors
    - 256-bit-wide memory bus
    - 160GB/s memory bandwidth
    - 2 teraflops performance*Configurable to dual AMD FirePro D500, each with 3GB GDDR5 VRAM, 1526 stream processors, 384-bit-wide memory bus, 240GB/s memory bandwidth, and 2.2 teraflops performance; or dual AMD FirePro D700, each with 6GB of GDDR5 VRAM, 2048 stream processors, 384-bit-wide memory bus, 264GB/s memory bandwidth, and 3.5 teraflops performance*
- **3.5GHz 6-Core**
  - Dual AMD FirePro D500 graphics processors with 3GB of GDDR5 VRAM each
    - 1526 stream processors
    - 384-bit-wide memory bus
    - 240GB/s memory bandwidth

# 697\_Mac Pro (Late 2013) - Technical Specifications.pdf

- 2.2 teraflops performance  
*Configurable to dual AMD FirePro D700, each with 6GB of GDDR5 VRAM, 2048 stream processors, 384-bit-wide memory bus, 264GB/s memory bandwidth, and 3.5 teraflops performance*
- **3.0GHz 8-Core**
  - Dual AMD FirePro D700 graphics processors with 6GB of GDDR5 VRAM each
    - 2048 stream processors
    - 384-bit-wide memory bus
    - 264GB/s memory bandwidth
    - 3.5 teraflops performance

## Display Support

- Connect up to:
  - Three 5K displays
  - Six Thunderbolt displays

## Storage

- 256GB
- PCIe-based flash storage  
*Configurable to 512GB or 1TB<sup>2</sup>*

## Audio

- Combined optical digital audio output/analog line out minijack
- 3.5 mm headphone jack with headset support
- HDMI port supports multichannel audio output
- Built-in speaker

## Connections and Expansion

- 4 USB 3
- 6 Thunderbolt 2
- Dual Gigabit Ethernet
- HDMI 1.4 Ultra HD

## Wireless

- 802.11ac Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g/n compatible
- Bluetooth 4.0 wireless technology

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 450W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 16,400 feet (5000 meters)
- Typical acoustical performance, sound pressure level (operator position): 12 dBA at idle

## In the Box

- Mac Pro, power cord

## Included Software

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.\* [Learn more](#)

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	2.05 ( $K_v = 0.25$ )	14.0
Wireless web	2.05 ( $K_v = 0.30$ )	14.5

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.

## Mac Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact.

- ENERGY STAR 6
- EPEAT Gold<sup>4</sup>
- BFR-free
- PVC-free<sup>5</sup>
- Highly recyclable

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\* Some features will be available on September 25, 2017, with macOS High Sierra.

1. Weight varies by configuration and manufacturing process.
2. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
3. Internet access required. 802.11ac is based on an IEEE draft specification.
4. Mac Pro achieved a Gold rating from EPEAT in the U.S. and Canada.
5. PVC-free power cord available in all regions except India and South Korea.

Published Date: Nov 1, 2017

# AirPort Time Capsule 802.11n (3rd Generation) - Technical Specifications

## Size and weight

- Length: 7.7 inches (197 mm)
- Width: 7.7 inches (197 mm)
- Height: 1.4 inches (36.3 mm)
- Weight: 3.5 pounds (1.6 kg)<sup>1</sup>

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>2</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Electrical

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 34W

## Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268: 2003, UL 60950, CSA-C22.2 No. 60950

## Storage

- 2TB or 3TB Serial ATA server-grade hard disk drive<sup>3</sup>

## Interfaces

- One Gigabit Ethernet WAN port for connecting a DSL or cable modem
- Three Gigabit Ethernet LAN ports for connecting computers or network devices
- USB port for connecting a USB printer or USB external hard drive
- 802.11n wireless

## Included in the box

- Time Capsule
- Power cord
- Printed documentation

## Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity (operational): 20% to 80% (noncondensing)
- Relative humidity (storage): 10% to 90%
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Wireless protocols

- IEEE 802.11a/b/g/n

## Compatibility

# 698\_AirPort Time Capsule 802.11n (3rd Generation) - Technical Specifications.pdf

- Interoperable with Wi-Fi Certified 802.11a, 802.11b, 802.11g, or 802.11n enabled Mac computers, iPad, iPhone, iPod touch, and Windows-based PCs
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP, IPv6 (6to4 and manual tunnels)

## Frequency bands

- 2.4GHz and 5GHz simultaneously

## Radio output power

- 20 dBm (nominal)

## Channels

- Channels 1-11, 36-48, and 149-165 approved for use in the United States and Canada
- Channels 1-13, 36-64, and 100-140 approved for use in Japan
- Channels 1-13, 36-64, 100-112, and 132-140 approved for use in Europe
- Channels 1-13, 36-64, and 149-165 approved for use in Australia, Hong Kong, and New Zealand

## System Requirements

	For Mac Users	For PC Users
For backup using Time Machine	Mac computer with Mac OS X 10.5.7 or later	-
For setup and administration	Mac with Mac OS X v10.5.7 or later	PC with Windows XP (SP3), Windows Vista (SP2), or Windows 7 (SP1)
For wireless client access	Mac with AirPort wireless capability	PC with Wi-Fi Certified 802.11a/b/g/n card
For shared printing with a USB printer	USB printer; Mac with Mac OS X v10.2.7 or later	USB printer; PC with Windows XP (SP3), Windows Vista (SP2), or Windows 7(SP1)
For AirPort Disk with a USB hard drive	Mac with Mac OS X v10.4.8 or later	PC with Windows XP (SP3), Windows Vista (SP2), or Windows 7(SP1)

## Extended service and support

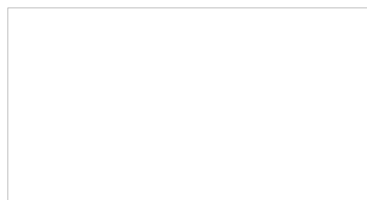
The [AppleCare Protection Plan](#) for your computer covers Time Capsule.

- 
1. Weight varies by configuration and manufacturing process.
  2. Support for Wi-Fi Protected Access (WPA/WPA2) requires Mac OS X v10.3 or later or Windows XP with SP2 or later.
  3. 1TB = 1 trillion bytes; actual formatted capacity less.

Wi-Fi Protected Access is a mark of the Wi-Fi Alliance. Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Product specifications are subject to change without notice..

Published Date: Jan 26, 2014

# MacBook Air (11-inch, Early 2014) - Technical Specifications



## Display

- 11.6-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions: 1366 by 768 (native), 1344 by 756, and 1280 by 720 pixels at 16:9 aspect ratio; 1152 by 720 and 1024 by 640 pixels at 16:10 aspect ratio; 1024 by 768 and 800 by 600 pixels at 4:3 aspect ratio

## Storage<sup>1</sup>

- **128GB**  
128GB PCIe-based flash storage
- **256GB**  
256GB PCIe-based flash storage  
*Configurable to 512GB flash storage.*

## Processor

- 1.4GHz dual-core Intel Core i5 (Turbo Boost up to 2.7GHz) with 3MB shared L3 cache  
*Configurable to 1.7GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 4MB shared L3 cache.*

## Memory

- 4GB of 1600MHz LPDDR3 onboard memory  
*Configurable to 8GB.*

## Battery and Power<sup>2</sup>

- Up to 9 hours wireless web
- Up to 9 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 38-watt-hour lithium-polymer battery
- 45W MagSafe 2 Power Adapter with cable management; MagSafe 2 power port

## Size and Weight

- *Height:* 0.11-0.68 inch (0.3-1.7 cm)
- *Width:* 11.8 inches (30 cm)
- *Depth:* 7.56 inches (19.2 cm)
- *Weight:* 2.38 pounds (1.08 kg)<sup>3</sup>

## Graphics and Video Support

- Intel HD Graphics 5000
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- Thunderbolt digital video output
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
  - HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

## Camera

- 720p FaceTime HD camera

## Connections and Expansions

- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt port (up to 10 Gbps)
- MagSafe 2 power port
- Headphone
- Dual mics

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi networking;<sup>4</sup> IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
- Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

**OS X Mavericks:** Easy to use, incredibly powerful, and packed with features you’ll love, OS X Mavericks is the world’s most advanced desktop operating system. [\*Learn more about OS X Mavericks\*](#)

OS X Mavericks Includes:

- AirDrop
- AirPlay
- Dictation
- Gatekeeper
- Notification Center
- Facebook Integration
- Twitter Integration
- Multiple Display Support
- Finder Tabs and Tags
- iCloud
- iCloud Keychain
- Dashboard
- Mission Control
- Spotlight Search
- Safari Power Saver
- App Nap
- Power Nap
- Compressed Memory

- Built-in Sharing

## Built-in Apps<sup>5</sup>

- iPhoto
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Maps
- iBooks
- Safari
- Mail
- FaceTime
- Messages
- Calendar
- Contacts
- Reminders
- Time Machine
- Photo Booth
- iTunes
- Game Center
- Preview
- Notes
- Mac App Store

## Limited Warranty and Service

Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Air
- Power adapter
- AC wall plug
- Power cord

## Configure to order

Configure your MacBook Air to order with these options, only at the [Apple Online Store](#):

- 1.7GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 4MB L3 cache
- 8GB memory upgrade
- 512GB of PCIe-based flash storage

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**MacBook Air is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>6</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR Version 6.0 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling



# 699\_MacBook Air (11-inch, Early 2014) - Technical Specifications.pdf

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.25 ( $K_V=0.25$ )	4.0
Wireless web	1.25 ( $K_V=0.25$ )	4.0

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_V$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_V$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 1.4GHz dual-core Intel Core i5 processor, 4GB memory, 256GB flash storage.

## Accessories

### Mac Software

- Aperture
- Logic Pro X
- Final Cut Pro X

### Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

### Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 45W MagSafe 2 Power Adapter
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Testing conducted by Apple in March 2014 using preproduction 1.4GHz dual-core Intel Core i5–based 13-inch MacBook Air units and preproduction 1.4GHz dual-core Intel Core i5–based 11-inch MacBook Air units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 720p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed into an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  3. Weight varies by configuration and manufacturing process.
  4. Requires Internet access. 802.11ac is based on an IEEE draft specification.
  5. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS X Mavericks required. Downloading apps requires an Apple ID.
  6. PVC-free AC power cord available in all regions except India and South Korea.
  7. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

# 699\_MacBook Air (11-inch, Early 2014) - Technical Specifications.pdf

Published Date: Nov 1, 2017

# iMac G5 - Technical Specifications

## iMac G5 - Technical Specifications

Configurations	1.6GHz 17-inch iMac	1.8GHz 17-inch iMac	1.8GHz 20-inch iMac
Model	M9248LL/A	M9249LL/A	M9250LL/A
Processor	1.6GHz PowerPC G5	1.8GHz PowerPC G5	1.8GHz PowerPC G5
Frontside bus	533MHz	600MHz	
Memory	256MB PC3200 (400MHz) DDR SDRAM, supports up to 2GB		
Graphics	NVIDIA GeForce FX 5200 Ultra with 64MB DDR SDRAM with AGP 8X support		
Hard drive <sup>1</sup>	80GB Serial ATA; 7200 rpm <sup>1</sup>		160GB Serial ATA; 7200 rpm <sup>1</sup>
Optical drive	Slot-loading Combo Drive (DVD-ROM/CD-RW)	Slot-loading SuperDrive (DVD-R/CD-RW)	
Display	17-inch (viewable) widescreen TFT active-matrix LCD, 1440 x 900 pixels, millions of colors		20-inch (viewable) widescreen TFT active-matrix LCD, 1680 x 1050 pixels, millions of colors
Ports	Two FireWire 400 ports; three USB 2.0 ports, two USB 1.1 ports (on keyboard); VGA output <sup>2</sup> ; S-video and composite video output <sup>2</sup>		
Networking	Built-in 10/100BASE-T Ethernet and 56K V.92 modem <sup>3</sup>		
Wireless	AirPort Extreme ready (based on 802.11g specification; IEEE 802.11b Wi-Fi certified) <sup>4</sup> ; internal Bluetooth module available as build-to-order option		
Audio	Headphone/optical digital audio output; audio line in		
System software	Mac OS X version 10.3 "Panther," includes Classic environment, Mail, iChat AV, Safari, Sherlock, Address Book, QuickTime, iSync, iCal		
Software	iLife '05 (includes iTunes, iPhoto, iMovie HD, iDVD and GarageBand), AppleWorks, Quicken 2004 for Mac, World Book 2004 Edition, Nanosaur 2, Marble Blast Gold, Microsoft Office 2004 for Mac Test Drive and Apple Hardware Test		
Hardware accessories	Built-in stereo speakers, Apple Keyboard, Apple Mouse, modem cable		
Limited warranty and service	Your iMac G5 comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.		
Internet access	All models include 30 days of free dial-up Internet service with EarthLink (North America only) activation. Internet access requires a compatible Internet service provider; fees may apply.		

Build-to-Order Options	Order a custom-configured computer from the online Apple Store or an authorized Apple reseller.
Cables and adapters	Apple VGA Display Adapter M8639G/A Apple Video Adapter M9109G/A Apple FireWire Cable (4-pin to 6-pin) M8706G/A iMac G5 VESA Mount Adapter Kit M9755G/A
DVD	Apple DVD-R Media Kit M9472G/A
Audio	Apple iPod
Wireless	AirPort Extreme Card M8881LL/A AirPort Express Featuring AirTunes M9470LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A Internal Bluetooth module with antenna D-Link USB Bluetooth Adapter T6295ZM/A
Services	AppleCare Protection Plan M8851LL/A .Mac Subscription: Retail Box MA175Z/A Family Pack MA176Z/A

### Technical Specifications

#### Processor and memory

- 1.6GHz or 1.8GHz PowerPC G5 processor with Velocity Engine
- 512K on-chip level 2 cache at full processor speed
- 533MHz or 600MHz frontside bus
- 256MB of PC3200 (400MHz) DDR SDRAM expandable to 2GB; two memory slots

#### Storage

- 80 or 160GB 7200-rpm Serial ATA hard disk drive

# 69\_iMac G5 - Technical Specifications.pdf

- One of the following optical drives:
  - Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed
  - SuperDrive (DVD-R/CD-RW): writes DVD-R discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 24x speed

## Communications

- Built-in 56K V.92 modem (RJ-11 connector)<sup>3</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and expansion slot for optional 54-Mbps AirPort Extreme Card (based on IEEE 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability)<sup>3</sup>
- Optional internal Bluetooth module

## Peripheral connections

- Two FireWire 400 ports; 8 watts shared
- Total of five USB ports: three USB 2.0 ports (up to 480 Mbps) on computer, two USB 1.1 ports on keyboard

## Display

- Built-in 17-inch (viewable) widescreen or 20-inch (viewable) widescreen TFT active-matrix liquid crystal display
- Millions of colors at all resolutions
- Typical viewing angle:
  - 17-inch models
    - 120° horizontal
    - 90° vertical
  - 20-inch model
    - 170° horizontal
    - 170° vertical
- Typical brightness: 200 cd/m (17-inch models); 230 cd/m (20-inch model)
- Typical contrast ratio: 350:1

## Graphics support

- NVIDIA GeForce FX 5200 Ultra graphics processor with AGP 8X support
- 64MB of dedicated Double Data Rate (DDR) video memory
- 17-inch display resolutions:
  - 16:10 aspect ratio
    - 1440 x 900 pixels (native)
    - 1152 x 720
    - 1024 x 640
    - 800 x 500
  - 4:3 aspect ratio
    - 1024 x 768 pixels
    - 800 x 600
    - 640 x 480
- 20-inch display resolutions:
  - 16:10 aspect ratio
    - 1680 x 1050 pixels (native)
    - 1344 x 840
    - 1280 x 800
    - 1024 x 640
    - 840 x 524
    - 800 x 500
  - 4:3 aspect ratio
    - 1024 x 768 pixels
    - 800 x 600
    - 640 x 480

## Video

- VGA output port for video mirroring on external display or projector<sup>2</sup>
- S-video and composite video output to connect directly to a TV or projector<sup>2</sup>
- Output resolutions: 640 x 480 pixels at 60Hz, 800 x 600 pixels at 75Hz and 1024 x 768 pixels at 75Hz

## Audio

- Built-in stereo speakers
- Internal 12-watt digital amplifier
- Headphone/optical digital audio output
- Audio line input
- Built-in microphone

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-120V AC or 100-240V AC, depending on country of purchase

# 69\_iMac G5 - Technical Specifications.pdf

- Frequency: 47Hz to 63Hz, single phase
- Maximum continuous power: 180W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

**Size and weight (20-inch)**

- Height: 18.6 inches (47.2 cm)
- Width: 19.4 inches (49.3 cm)
- Depth: 7.4 inches (18.9 cm)
- Weight: 25.2 pounds (11.4 kg)<sup>5</sup>

**Size and weight (17-inch)**

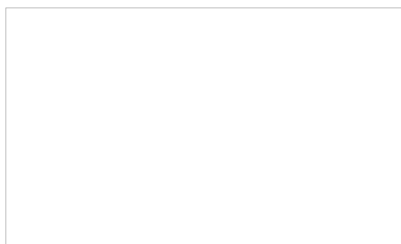
- Height: 16.9 inches (43.0 cm)
- Width: 16.8 inches (42.6 cm)
- Depth: 6.8 inches (17.3 cm)
- Weight: 18.5 pounds (8.4 kg)<sup>5</sup>

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Requires adapter, sold separately.
3. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower.
4. Wireless Internet access requires AirPort Extreme Card; AirPort, AirPort Express or AirPort Extreme Base Station; and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.
5. Weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply.  
Product contains electronic documentation.  
Backup copy of software is included.

**Published Date:** Jul 26, 2017

# MacBook Air (13-inch, Early 2014) - Technical Specifications



## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions: 1440 by 900 (native), 1280 by 800, 1152 by 720, and 1024 by 640 pixels at 16:10 aspect ratio and 1024 by 768 and 800 by 600 pixels at 4:3 aspect ratio

## Storage<sup>1</sup>

- **128GB**  
128GB PCIe-based flash storage
- **256GB**  
256GB PCIe-based flash storage  
*Configurable to 512GB flash storage.*

## Processor

- 1.4GHz dual-core Intel Core i5 (Turbo Boost up to 2.7GHz) with 3MB shared L3 cache  
*Configurable to 1.7GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 4MB shared L3 cache.*

## Memory

- 4GB of 1600MHz LPDDR3 onboard memory  
*Configurable to 8GB.*

## Battery and Power<sup>2</sup>

- Up to 12 hours wireless web
- Up to 12 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 54-watt-hour lithium-polymer battery
- 45W MagSafe 2 Power Adapter with cable management; MagSafe 2 power port

## Size and Weight

- *Height:* 0.11-0.68 inch (0.3-1.7 cm)
- *Width:* 12.8 inches (32.5 cm)
- *Depth:* 8.94 inches (22.7 cm)
- *Weight:* 2.96 pounds (1.35 kg)<sup>3</sup>

## Graphics and Video Support

- Intel HD Graphics 5000
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on an external display, both at millions of colors
- Thunderbolt digital video output
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
  - HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

## Camera

# 700\_MacBook Air (13-inch, Early 2014) - Technical Specifications.pdf

- 720p FaceTime HD camera

## Connections and Expansions

- Headphone
- Dual mics
- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt port (up to 10 Gbps)
- MagSafe 2 power port
- SDXC card slot

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi networking;<sup>4</sup> IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
- Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

**OS X Mavericks:** Easy to use, incredibly powerful, and packed with features you’ll love, OS X Mavericks is the world’s most advanced desktop operating system. [\*Learn more about OS X Mavericks\*](#)

OS X Mavericks Includes:

- AirDrop
- AirPlay
- Dictation
- Gatekeeper
- Notification Center
- Facebook Integration
- Twitter Integration
- Multiple Display Support
- Finder Tabs and Tags
- iCloud
- iCloud Keychain
- Dashboard
- Mission Control
- Spotlight Search
- Safari Power Saver
- App Nap

# 700\_MacBook Air (13-inch, Early 2014) - Technical Specifications.pdf

- Power Nap
- Compressed Memory
- Built-in Sharing

## Built-in Apps<sup>5</sup>

- iPhoto
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Maps
- iBooks
- Safari
- Mail
- FaceTime
- Messages
- Calendar
- Contacts
- Reminders
- Time Machine
- Photo Booth
- iTunes
- Game Center
- Preview
- Notes
- Mac App Store

## Limited Warranty and Service

Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Air
- Power adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Air to order with these options, only at the [Apple Online Store](#):

- 1.7GHz dual-core Intel Core i7 (Turbo Boost up to 3.3GHz) with 4MB L3 cache
- 8GB memory upgrade
- 512GB of PCIe-based flash storage

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**MacBook Air is designed with the following features to reduce its environmental impact:**

- BFR-free
- PVC-free<sup>6</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR Version 6.0 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental](#)



# 700\_MacBook Air (13-inch, Early 2014) - Technical Specifications.pdf

[Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.25 ( $K_V=0.25$ )	4.0
Wireless web	1.30 ( $K_V=0.25$ )	4.0

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_V$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_V$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 1.4GHz dual-core Intel Core i5 processor, 4GB memory, 256GB flash storage.

## Accessories

### Mac Software

- Aperture
- Logic Pro X
- Final Cut Pro X

### Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

### Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 45W MagSafe 2 Power Adapter
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Testing conducted by Apple in March 2014 using preproduction 1.4GHz dual-core Intel Core i5-based 13-inch MacBook Air units and preproduction 1.4GHz dual-core Intel Core i5-based 11-inch MacBook Air units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 720p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed into an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  3. Weight varies by configuration and manufacturing process.
  4. Requires Internet access. 802.11ac is based on an IEEE draft specification.
  5. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS

# 700\_MacBook Air (13-inch, Early 2014) - Technical Specifications.pdf

X Mavericks required. Downloading apps requires an Apple ID.

6. PVC-free AC power cord available in all regions except India and South Korea.

7. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Nov 1, 2017

# iMac (21.5-inch, Mid 2014) - Technical Specifications



## Display

- 21.5-inch (diagonal) LED-backlit display with IPS technology; 1920-by-1080 resolution with support for millions of colors

## Processor

- **1.4GHz**  
dual-core Intel Core i5 processor (Turbo Boost up to 2.7GHz) with 3MB shared L3 cache

## Memory

- 8GB of 1600MHz LPDDR3 onboard memory

## Storage<sup>1</sup>

- 500GB (5400-rpm) hard drive  
Configurable to 1TB hard drive, 1TB Fusion Drive, or 256GB of PCIe-based flash storage.

## Graphics

- Intel HD Graphics 5000

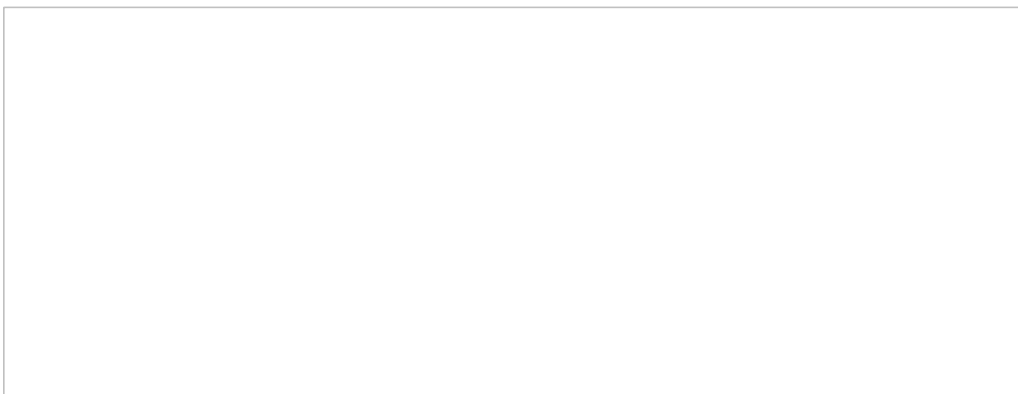
## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to a 30-inch display (2560 by 1600 pixels) on an external display
- Support for extended desktop and video mirroring modes
- Support for Target Display Mode via the Thunderbolt port using a Thunderbolt to Thunderbolt cable (sold separately)

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
- Headphone/optical digital audio output (minijack)
- Support for Apple iPhone headset with microphone

## Connections and Expansion



# 701\_iMac (21.5-inch, Mid 2014) - Technical Specifications.pdf

- Headphone
- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt ports
  - Mini DisplayPort output
  - Support for DVI, VGA, and dual-link DVI (adapters sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Kensington lock slot

## Input

### Apple Wireless Keyboard

Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)

### Magic Mouse

Smooth, seamless Multi-Touch surface with support for simple gestures (scrolling and swiping). Click and double-click anywhere. Ambidextrous construction accommodates left- and right-handed users.

### Magic Trackpad

Glass Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch and expand, swipe, three-finger swipe, four-finger swipe, tap, double-tap, rotate, screen zoom, scroll, click and drag, click drag and lock, secondary click A and B.

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking;<sup>2</sup> IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Size and Weight

- Height: 17.7 inches (45.0 cm)
- Width: 20.8 inches (52.8 cm)
- Stand depth: 6.9 inches (17.5 cm)
- Weight: 12.5 pounds (5.68 kg)<sup>3</sup>

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet

## Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- iMac
- Apple Wireless Keyboard
- Apple Magic Mouse
- Power cord

## Operating System

- **OS X Mavericks**  
Easy to use, incredibly powerful, and packed with features you'll love, OS X Mavericks is the world's most advanced desktop operating system. [Learn more](#)

## OS X Mavericks Includes

# 701\_iMac (21.5-inch, Mid 2014) - Technical Specifications.pdf

- AirDrop
- AirPlay
- Dictation
- Gatekeeper
- Notification Center
- Facebook Integration
- Twitter Integration
- Multiple Display Support
- Finder Tabs and Tags
- iCloud
- iCloud Keychain
- Dashboard
- Mission Control
- Spotlight Search
- Safari Power Saver
- App Nap
- Power Nap
- Compressed Memory
- Built-in Sharing

## Built-in Apps<sup>4</sup>

- iPhoto
- iMovie
- GarageBand
- Pages
- Keynote
- Numbers
- Maps
- iBooks
- Safari
- Mail
- FaceTime
- Messages
- Calendar
- Contacts
- Reminders
- Time Machine
- Photo Booth
- iTunes
- Game Center
- Preview
- Notes
- Mac App Store

## Configure to Order

Configure your iMac with these options, only at the [Apple Online Store](#).

Looking for an iMac you can mount on a wall or an adjustable arm? [Choose an iMac with a Built-in VESA Mount Adapter](#).

- Magic Trackpad
- 1TB hard drive
- 1TB Fusion Drive
- 256GB of flash storage

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iMac is designed with the following features to reduce its environmental impact:**

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>

# 701\_iMac (21.5-inch, Mid 2014) - Technical Specifications.pdf

- Mercury-free LED-backlit display
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR Version 6.0 requirements
- Rated EPEAT Gold<sup>6</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	2.00 ( $K_V=0.25$ )	11.0
Hard drive seek	2.00 ( $K_V=0.25$ )	11.0
Wireless web	2.00 ( $K_V=0.25$ )	11.0

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_V$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_V$ .
6. The Wireless web test browses 25 popular websites.

## Accessories and Software

### Mac Software

- Aperture
- Logic Pro X
- Final Cut Pro X

### Adapters

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

### Other Accessories

- Magic Trackpad
- Apple USB SuperDrive
- Apple Battery Charger
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Based on an IEEE 802.11ac draft specification.
  3. Weight varies by configuration and manufacturing process.

## 701\_iMac (21.5-inch, Mid 2014) - Technical Specifications.pdf

4. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS X Mavericks required. Downloading apps requires an Apple ID.
5. PVC-free AC power cord available in all regions except India and South Korea.
6. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Nov 1, 2017

# OS X Mavericks - Technical Specifications

## General Requirements

- OS X v10.6.8 or later
- 2GB of memory
- 8GB of available space
- Some features require an Apple ID; terms apply.
- Some features require a compatible Internet service provider; fees may apply.

## Supported Models

- iMac (Mid 2007 or newer)
- MacBook (Late 2008 Aluminum, or Early 2009 or newer)
- MacBook Pro (Mid/Late 2007 or newer)
- Xserve (Early 2009)
- MacBook Air (Late 2008 or newer)
- Mac mini (Early 2009 or newer)
- Mac Pro (Early 2008 or newer)

## What's Included

### Applications

- Automator
- Calculator
- Calendar
- Chess
- Contacts
- Dashboard
- Dictionary
- DVD Player
- FaceTime
- Font Book
- iBooks
- Image Capture
- iTunes
- Launchpad
- Mac App Store
- Maps
- Mail
- Messages
- Mission Control
- Notes
- Photo Booth
- Preview
- QuickTime Player
- Reminders
- Safari
- Stickies
- System Preferences
- TextEdit
- Time Machine

### Utilities

- Activity Monitor
- AirPort Utility
- AppleScript Editor
- Audio MIDI Setup
- Bluetooth File Exchange
- Boot Camp Assistant
- ColorSync Utility
- Console
- DigitalColor Meter



# 702\_OS X Mavericks - Technical Specifications.pdf

- Disk Utility
- Grab
- Grapher
- Keychain Access
- Migration Assistant
- System Information
- Terminal
- VoiceOver Utility

## Languages

- English
- Japanese
- French
- German
- Spanish
- Italian
- Dutch
- Swedish
- Danish
- Norwegian
- Finnish
- Traditional Chinese
- Simplified Chinese
- Korean
- Brazilian Portuguese
- Portuguese (Portugal)
- Russian
- Polish
- Czech
- Turkish
- Hungarian
- Arabic
- Catalan
- Croatian
- Greek
- Hebrew
- Romanian
- Slovak
- Thai
- Ukrainian
- Malay
- Indonesian
- Vietnamese

## Feature Requirements

### Time Machine

Requires an additional hard drive or [AirPort Time Capsule](#) (sold separately).

### Photo Booth

Requires a FaceTime or iSight camera (built in or external), USB video class (UVC) camera, or FireWire DV camcorder. Backdrop effects when using a DV camcorder require fixed focus, exposure, and white balance.

### FaceTime

Video calls require a built-in FaceTime camera, an iSight camera (built in or external), a USB video class (UVC) camera, or a FireWire DV camcorder, and a 128-Kbps upstream and downstream Internet connection. Making HD video calls requires a built-in FaceTime HD camera and a 1-Mbps upstream and downstream Internet connection. Receiving HD video calls requires a supported Intel-based Mac.

### AirDrop

Supported by the following Mac models:

- MacBook Pro (Late 2008 or newer)\*

# 702\_OS X Mavericks - Technical Specifications.pdf

- MacBook Air (Late 2010 or newer)
- MacBook (Late 2008 or newer)\*
- iMac (Early 2009 or newer)
- Mac mini (Mid 2010 or newer)
- Mac Pro (Early 2009 with AirPort Extreme card, or Mid 2010 or newer)

## Boot Camp

Supports existing Boot Camp installations with Windows XP Service Pack 2, Windows Vista, or Windows 7. New Boot Camp installations require Windows 7 or Windows 8 (sold separately).

## Exchange Support

Requires Microsoft Exchange Server 2007 Service Pack 1 Update Rollup 4 or Exchange Server 2010. Auto-setup requires enabling the Autodiscovery feature of Microsoft Exchange Server.

## AirPlay Mirroring

Requires a second-generation Apple TV or later. Supported by the following Mac models:

- iMac (Mid 2011 or newer)
- Mac mini (Mid 2011 or newer)
- MacBook Air (Mid 2011 or newer)
- MacBook Pro (Early 2011 or newer)
- Mac Pro (late 2013)

## Power Nap

Supported by the following Mac models:

- MacBook Air (Late 2010 or newer)
- MacBook Pro with Retina display
- iMac (Late 2012 or newer)
- Mac Pro (Late 2013)
- Mac mini (Late 2012)

## Gestures

Requires a Multi-Touch trackpad, Magic Trackpad, or Magic Mouse.

## VoiceOver Gestures

Requires a Multi-Touch trackpad or Magic Trackpad.

## Dictation

Requires a microphone (built in or external).

## Mac App Store

Available only to persons age 13 or older in the U.S. and many other countries. Requires compatible hardware and software and Internet access; broadband recommended (fees may apply). Terms apply.

## White Papers

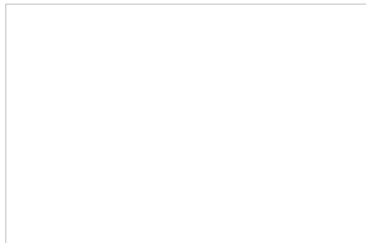
- [OS X Mavericks Core Technologies Overview](#)
- [OS X Server Product Overview](#)
- [OS X Power Efficiency Technology Overview](#)

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\*The MacBook Pro (17-Inch Late 2008) and the white MacBook (Late 2008) do not support AirDrop.

Published Date: Jul 17, 2014

# MacBook Pro (Retina, 13-inch, Mid 2014) - Technical Specifications



## Display

- Retina display: 13.3-inch (diagonal) LED-backlit display with IPS technology; 2560-by-1600 resolution at 227 pixels per inch with support for millions of colors
- Native resolution: 2560 by 1600 pixels (Retina); scaled resolutions: 1680 by 1050, 1440 by 900, and 1024 by 640 pixels

## Processor

- **2.6GHz**  
2.6GHz dual-core Intel Core i5 processor (Turbo Boost up to 3.1GHz) with 3MB shared L3 cache  
*Configurable to 2.8GHz dual-core Intel Core i5 (Turbo Boost up to 3.3GHz) with 3MB shared L3 cache or 3.0GHz dual-core Intel Core i7 (Turbo Boost up to 3.5GHz) with 4MB shared L3 cache.*
- **2.8GHz**  
2.8GHz dual-core Intel Core i5 processor (Turbo Boost up to 3.3GHz) with 3MB shared L3 cache  
*Configurable to 3.0GHz dual-core Intel Core i7 (Turbo Boost up to 3.5GHz) with 4MB shared L3 cache.*

## Memory

- 8GB of 1600MHz DDR3L onboard memory  
*Configurable to 16GB.*

## Storage<sup>1</sup>

- **2.6GHz - 128GB**  
128GB PCIe-based flash storage
- **2.6GHz - 256GB**  
256GB PCIe-based flash storage
- **2.8GHz - 512GB**  
512GB PCIe-based flash storage  
*Configurable to 1TB flash storage.*

## Size and Weight

- Height: 0.71 inch (1.8 cm)
- Width: 12.35 inches (31.4 cm)
- Depth: 8.62 inches (21.9 cm)
- Weight: 3.46 pounds (1.57 kg)<sup>2</sup>

## Graphics and Video support

- Intel Iris Graphics
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on up to two external displays, both at millions of colors
- **Thunderbolt digital video output**
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- **HDMI video output**
  - Support for 1080p resolution at up to 60Hz
  - Support for 3840-by-2160 resolution at 30Hz

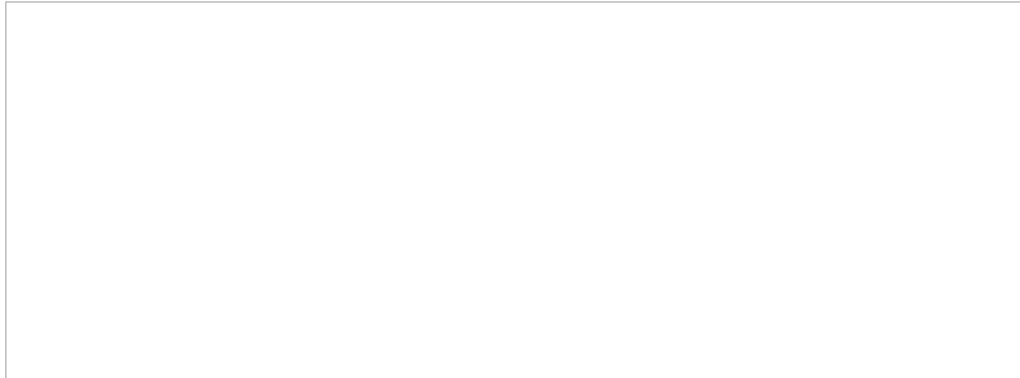
# 703\_MacBook Pro (Retina, 13-inch, Mid 2014) - Technical Specifications.pdf

- Support for 4096-by-2160 resolution at 24Hz

## Camera

- 720p FaceTime HD camera

## Connections and Expansion



- MagSafe 2 power port
- Two Thunderbolt 2 ports (up to 20 Gbps)
- Two USB 3 ports (up to 5 Gbps)
- HDMI port
- Headphone port
- SDXC card slot
- Apple Thunderbolt to FireWire Adapter (sold separately)
- Apple Thunderbolt to Gigabit Ethernet Adapter (sold separately)

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Support for Apple iPhone headset with remote and microphone
  - Support for audio line out (digital/analog)

## Keyboard and Trackpad

Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted "T" arrangement) with ambient light sensor.

Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities.

## Battery and Power<sup>4</sup>

- Up to 9 hours wireless web
- Up to 9 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 71.8-watt-hour lithium-polymer battery
- 60W MagSafe 2 Power Adapter with cable management system; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz

# 703\_MacBook Pro (Retina, 13-inch, Mid 2014) - Technical Specifications.pdf

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 113° F (–25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

**OS X Mavericks:** Easy to use, incredibly powerful, and packed with features you'll love, OS X Mavericks is the world's most advanced desktop operating system. [Learn more](#)

### OS X Mavericks Includes

- AirDrop
- AirPlay
- Dictation
- Gatekeeper
- Notification Center
- Facebook Integration
- Twitter Integration
- Multiple Display Support
- Finder Tabs and Tags
- iCloud
- iCloud Keychain
- Dashboard
- Mission Control
- Spotlight Search
- Safari Power Saver
- App Nap
- Power Nap
- Compressed Memory
- Built-in Sharing

## Built-in Apps<sup>5</sup>

- iPhoto
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Maps
- iBooks
- Safari
- Mail
- FaceTime
- Messages
- Calendar
- Contacts
- Reminders
- Time Machine
- Photo Booth
- iTunes
- Game Center
- Preview
- Notes
- Mac App Store

## Limited Warranty and Service

Your MacBook Pro with Retina display comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Pro with Retina display
- MagSafe 2 Power Adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Pro to order with these options, only at the [Apple Online Store](#):

- Up to 3.0GHz dual-core Intel Core i7 (Turbo Boost up to 3.5GHz) with 4MB shared L3 cache
- Up to 16GB memory upgrade
- Up to 1TB of flash storage<sup>1</sup>

## MacBook Pro with Retina display and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**MacBook Pro with Retina display is designed with the following features to reduce its environmental impact:**

- Highly recyclable aluminum enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>6</sup>
- Reduced packaging volume
- Meets ENERGY STAR 6.0 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Accessories

### Mac Software

- Aperture
- Logic Pro X
- Final Cut Pro X

### Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

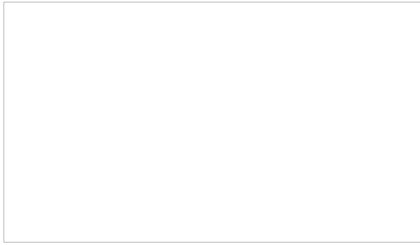
### Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 60W MagSafe 2 Power Adapter
- 85W MagSafe 2 Power Adapter
- AppleCare Protection Plan

1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
2. Weight varies by configuration and manufacturing process.
3. Requires Internet access. 802.11ac is based on an IEEE draft specification.
4. Testing conducted by Apple in July 2014 using preproduction 2.5GHz quad-core Intel Core i7–based 15-inch MacBook Pro units, preproduction 2.2GHz quad-core Intel Core i7–based 15-inch MacBook Pro units, and preproduction 2.8GHz dual-core Intel Core i5–based 13-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 720p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
5. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS X Mavericks required. Downloading apps requires an Apple ID.
6. PVC-free AC power cord available in all regions except India and South Korea.
7. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Aug 2, 2016

# MacBook Pro (Retina, 15-inch, Mid 2014) - Technical Specifications



## Display

- Retina display: 15.4-inch (diagonal) LED-backlit display with IPS technology; 2880-by-1800 resolution at 220 pixels per inch with support for millions of colors
- Native resolution: 2880 by 1800 pixels (Retina); scaled resolutions: 1920 by 1200, 1680 by 1050, 1280 by 800, and 1024 by 640 pixels

## Processor

- **2.2GHz**  
2.2GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.4GHz) with 6MB shared L3 cache  
*Configurable to 2.5GHz quad-core Intel Core i7 (Turbo Boost up to 3.7GHz) with 6MB shared L3 cache or 2.8GHz quad-core Intel Core i7 (Turbo Boost up to 4.0GHz) with 6MB shared L3 cache.*
- **2.5GHz**  
2.5GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.7GHz) with 6MB shared L3 cache  
*Configurable to 2.8GHz quad-core Intel Core i7 (Turbo Boost up to 4.0GHz) with 6MB shared L3 cache.*

## Memory

- 16GB of 1600MHz DDR3L onboard memory

## Storage<sup>1</sup>

- **2.2GHz - 256GB**  
256GB PCIe-based flash storage  
*Configurable to 512GB or 1TB flash storage.*
- **2.5GHz - 512GB**  
512GB PCIe-based flash storage  
*Configurable to 1TB flash storage.*

## Size and Weight

- Height: 0.71 inch (1.8 cm)
- Width: 14.13 inches (35.89 cm)
- Depth: 9.73 inches (24.71 cm)
- Weight: 4.46 pounds (2.02 kg)<sup>2</sup>

## Graphics and Video support

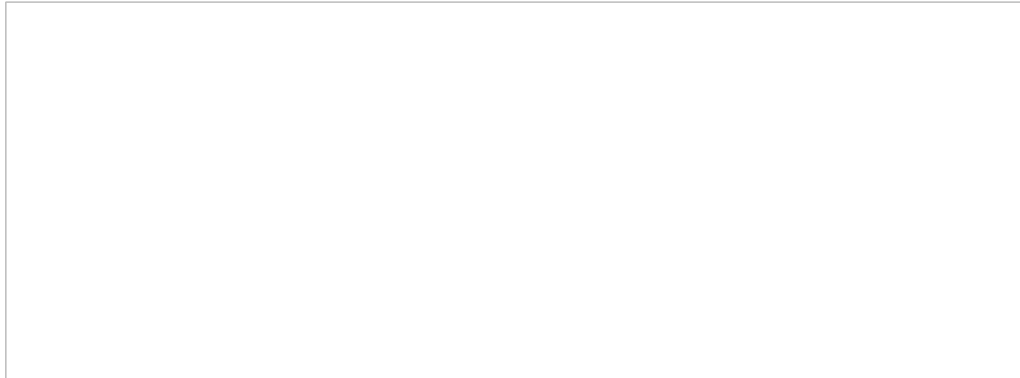
- Intel Iris Pro Graphics
- NVIDIA GeForce GT 750M with 2GB of GDDR5 memory and automatic graphics switching
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 2560 by 1600 pixels on up to two external displays, both at millions of colors
- **Thunderbolt digital video output**
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- **HDMI video output**
  - Support for 1080p resolution at up to 60Hz
  - Support for 3840-by-2160 resolution at 30Hz
  - Support for 4096-by-2160 resolution at 24Hz



## Camera

- 720p FaceTime HD camera

## Connections and Expansion



- MagSafe 2 power port
- Two Thunderbolt 2 ports (up to 20 Gbps)
- Two USB 3 ports (up to 5 Gbps)
- HDMI port
- Headphone port
- SDXC card slot
- Apple Thunderbolt to FireWire Adapter (sold separately)
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## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking;<sup>3</sup> IEEE 802.11a/b/g/n compatible
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## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Support for Apple iPhone headset with remote and microphone
  - Support for audio line out (digital/analog)

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Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted "T" arrangement) with ambient light sensor.

Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities.

## Battery and Power<sup>4</sup>

- Up to 8 hours wireless web
- Up to 8 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 95-watt-hour lithium-polymer battery
- 85W MagSafe 2 Power Adapter with cable management system; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)

# 704\_MacBook Pro (Retina, 15-inch, Mid 2014) - Technical Specifications.pdf

- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

**OS X Mavericks:** Easy to use, incredibly powerful, and packed with features you'll love, OS X Mavericks is the world's most advanced desktop operating system. [Learn more.](#)

### OS X Mavericks Includes

- AirDrop
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- Dictation
- Gatekeeper
- Notification Center
- Facebook Integration
- Twitter Integration
- Multiple Display Support
- Finder Tabs and Tags
- iCloud
- iCloud Keychain
- Dashboard
- Mission Control
- Spotlight Search
- Safari Power Saver
- App Nap
- Power Nap
- Compressed Memory
- Built-in Sharing

## Built-in Apps<sup>5</sup>

- iPhoto
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Maps
- iBooks
- Safari
- Mail
- FaceTime
- Messages
- Calendar
- Contacts
- Reminders
- Time Machine
- Photo Booth
- iTunes
- Game Center
- Preview
- Notes
- Mac App Store

## Limited Warranty and Service

Your MacBook Pro with Retina display comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

# 704\_MacBook Pro (Retina, 15-inch, Mid 2014) - Technical Specifications.pdf

- MacBook Pro with Retina display
- MagSafe 2 Power Adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Pro to order with these options, only at the [Apple Online Store](#):

- Up to 2.8GHz quad-core Intel Core i7 (Turbo Boost up to 4.0GHz) with 6MB shared L3 cache
- Up to 1TB of flash storage<sup>1</sup>

## MacBook Pro with Retina display and the Environment

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**MacBook Pro with Retina display is designed with the following features to reduce its environmental impact:**

- Highly recyclable aluminum enclosure
- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>6</sup>
- Reduced packaging volume
- Meets ENERGY STAR 6.0 requirements
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## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.40 ( $K_V=0.25$ )	6.0
Wireless web	1.40 ( $K_V=0.25$ )	5.5

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_V$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_V$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.5GHz quad-core Intel Core i7 processor, 16GB memory, 512GB flash storage, Intel Iris Pro & NVIDIA GeForce GT 750M graphics.

## Accessories

### Mac Software

- Aperture
- Logic Pro X
- Final Cut Pro X

### Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter

# 704\_MacBook Pro (Retina, 15-inch, Mid 2014) - Technical Specifications.pdf

- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

## AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

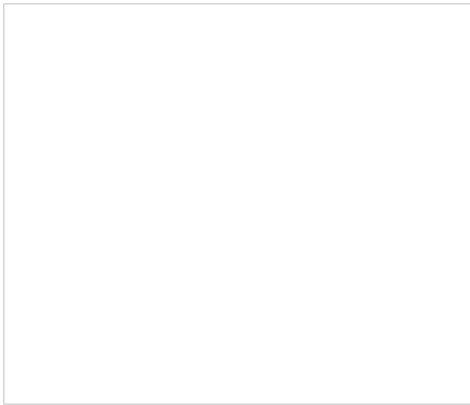
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- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 60W MagSafe 2 Power Adapter
- 85W MagSafe 2 Power Adapter
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Requires Internet access. 802.11ac is based on an IEEE draft specification.
  4. Testing conducted by Apple in July 2014 using preproduction 2.5GHz quad-core Intel Core i7–based 15-inch MacBook Pro units, preproduction 2.2GHz quad-core Intel Core i7–based 15-inch MacBook Pro units, and preproduction 2.8GHz dual-core Intel Core i5–based 13-inch MacBook Pro units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 720p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  5. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS X Mavericks required. Downloading apps requires an Apple ID.
  6. PVC-free AC power cord available in all regions except India and South Korea.
  7. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 13, 2016

# iPhone 6 - Technical Specifications



## Finish

- Silver
- Gold
- Space Gray

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB
- 128GB

## Weight and Dimensions<sup>2</sup>

- Height: 5.44 inches (138.1 mm)
- Width: 2.64 inches (67.0 mm)
- Depth: 0.27 inch (6.9 mm)
- Weight: 4.55 ounces (129 grams)

## Display

- Retina HD display
- 4.7-inch (diagonal) LED-backlit widescreen Multi-Touch display with IPS technology
- 1334-by-750-pixel resolution at 326 ppi
- 1400:1 contrast ratio (typical)
- 500 cd/m<sup>2</sup> max brightness (typical)
- Full sRGB standard
- Dual-domain pixels for wide viewing angles
- Fingerprint-resistant oleophobic coating on front
- Support for display of multiple languages and characters simultaneously
- Display Zoom
- Reachability

## Chips

- A8 chip with 64-bit architecture
- M8 motion coprocessor

## iSight Camera

- 8-megapixel iSight camera with 1.5 $\mu$  pixels
- Autofocus with Focus Pixels
- *f*/2.2 aperture
- Optical image stabilization (iPhone 6 Plus only)
- True Tone flash
- Five-element lens
- Hybrid IR filter

# 705\_iPhone 6 - Technical Specifications.pdf

- Backside illumination sensor
- Sapphire crystal lens cover
- Auto image stabilization
- Auto HDR for photos
- Face detection
- Exposure control
- Panorama (up to 43 megapixels)
- Burst mode
- Tap to focus
- Photo geotagging
- Timer mode

## Video Recording

- 1080p HD video recording (30 fps or 60 fps)
- True Tone flash
- Slo-mo video (120 fps or 240 fps)
- Time-lapse video with stabilization
- Cinematic video stabilization
- Continuous autofocus video
- Take still photos while recording video
- Improved face detection
- 3x zoom
- Video geotagging

## FaceTime HD Camera

- 1.2-megapixel photos
- *f*/2.2 aperture
- 720p HD video recording
- Backside illumination sensor
- Auto HDR for photos and videos
- Face detection
- Burst mode
- Exposure control
- Timer mode

## Touch ID

- Fingerprint identity sensor built into the Home button

## Apple Pay

- Pay with your iPhone using Touch ID in stores and in apps

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1549 (GSM)\* / Model A1522 (GSM)\***
  - UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
  - GSM/EDGE (850, 900, 1800, 1900 MHz)
  - LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26, 28, 29)
- **Model A1549 (CDMA)\* / Model A1522 (CDMA)\***
  - CDMA EV-DO Rev. A and Rev. B (800, 1700/2100, 1900, 2100 MHz)
  - UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
  - GSM/EDGE (850, 900, 1800, 1900 MHz)
  - LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26, 28, 29)

### **Model A1586\* / Model A1524\***

- CDMA EV-DO Rev. A and Rev. B (800, 1700/2100, 1900, 2100 MHz)
- UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
- TD-SCDMA 1900 (F), 2000 (A)
- GSM/EDGE (850, 900, 1800, 1900 MHz)
- FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26, 28, 29)
- TD-LTE (Bands 38, 39, 40, 41)

# 705\_iPhone 6 - Technical Specifications.pdf

- **All models**
  - 802.11a/b/g/n/ac Wi-Fi
  - Bluetooth 4.2 wireless technology
  - NFC

## Location

- Assisted GPS and GLONASS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>3</sup>

- FaceTime video
- Initiate video calls over Wi-Fi or cellular to any FaceTime-enabled device

## Audio Calling<sup>3</sup>

- FaceTime audio
- iPhone 6 to any FaceTime audio-enabled device over Wi-Fi or cellular
- Voice over LTE (VoLTE)<sup>4</sup>
- Wi-Fi calling<sup>4</sup>

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 1080p, 60 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Siri<sup>5</sup>

- Use your voice to send messages, set reminders, and more
- Get proactive suggestions
- Use hands-free
- Listen and identify songs

[Learn more about Siri](#)

## External Buttons and Connectors

- Home/Touch ID sensor
- Volume up/down
- Ring/silent
- On/off-Sleep/wake
- Microphone
- Lightning connector
- 3.5mm headphone jack
- Built-in speaker

## Power and Battery<sup>6</sup>

- Built-in rechargeable lithium-ion battery

# 705\_iPhone 6 - Technical Specifications.pdf

- Charging via USB to computer system or power adapter
- Talk time: Up to 14 hours on 3G
- Internet use: Up to 10 hours on 3G, up to 10 hours on LTE, up to 11 hours on Wi-Fi
- HD video playback: Up to 11 hours
- Audio playback: Up to 50 hours
- Standby time: Up to 10 days

## Sensors

- Touch ID
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 9

The world's most advanced mobile operating system gets major enhancements to built-in apps, a smarter Siri and search, and much more. [Learn more about iOS 9](#)

iOS 9 includes:

- AirDrop
- AirPlay
- AirPrint
- Control Center
- Notification Center
- Siri
- Spotlight Search
- Facebook Integration
- Twitter Integration
- iCloud
- iCloud Keychain
- Multitasking
- Wallet

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Calendar
- iTunes Store
- App Store
- Notes
- News
- Contacts
- iBooks
- Game Center
- Weather
- Reminders
- Voice Memos
- Clock
- Videos
- Stocks
- Calculator



# 705\_iPhone 6 - Technical Specifications.pdf

- Compass
- Podcasts
- Watch
- Tips
- iCloud Drive
- Find My iPhone
- Find My Friends

## Free Apps from Apple<sup>7</sup>

- iMovie
- Pages
- Keynote
- Numbers
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Remote

## Headphones

- Apple EarPods with Remote and Mic
- Storage and travel case

## SIM Card

- Nano-SIM

iPhone 6 is not compatible with existing micro-SIM cards.

## Connector

- Lightning

## Rating for Hearing Aids

- iPhone 6 (Model A1549, A1586): M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>8</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X v10.8.5 or later
- PC: Windows 7 or later
- iTunes 12.3 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

# 705\_iPhone 6 - Technical Specifications.pdf

- **Language support**

English (Australia, Canada, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **QuickType keyboard support**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Mexico, Spain), Arabic, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Marathi, Norwegian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swedish, Tamil, Telugu, Thai, Turkish, Ukrainian, Urdu, Vietnamese

- **QuickType keyboard support with predictive input<sup>9</sup>**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

- **Siri languages**

English (Australia, Canada, India, New Zealand, Singapore, UK, U.S.), Spanish (Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Norwegian (Norway), Russian (Russia), Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)

- **Dictation languages**

English (Australia, Canada, India, Ireland, New Zealand, Philippines, Singapore, South Africa, UK, U.S.), Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish (Denmark), Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew (Israel), Hungarian, Indonesian, Malaysian, Norwegian (Norway), Polish, Portuguese (Brazil, Portugal), Romanian, Russian (Russia), Slovakian, Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified), French, German, Hindi, Italian, Japanese, Korean, Spanish, Dutch, Norwegian, Portuguese (Brazil), Russian, Swedish, Thai, Turkish

- **Bilingual dictionary support**

Chinese (Simplified), French, German, Japanese, Korean, Spanish

- **Spell check**

English (Australia, Canada, UK, U.S.), French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese (Brazil, Portugal), Russian, Swedish, Turkish

## In the Box

- iPhone
- Apple EarPods with Remote and Mic
- Lightning to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPhone 6 and iPhone 6 Plus embody Apple's continuing environmental progress. They are designed with the following features to reduce environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Recyclable aluminum enclosure
- Power adapter outperforms strictest global energy efficiency standards
- Speaker enclosure with 30 percent post-consumer recycled plastic

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

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## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more about how to recycle your iPhone.](#)

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\*To identify your iPhone model number, see <http://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).

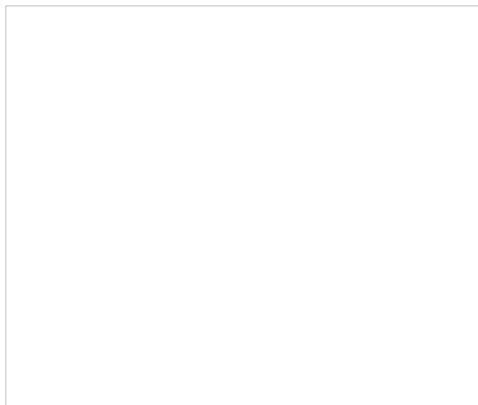
1. 1GB = 1 billion bytes; actual formatted capacity less. Requires a plan (which may include restrictions on switching service providers and roaming, even after contract expiration); sold separately to qualified customers. Credit check required; must be 18 or older. Wireless service is provided by and is the sole responsibility of your wireless service provider. Some capabilities are not available in all areas and depend on your wireless plan and service provider network. Service may not be available in all areas or at the signal strength, rates, speeds, or bandwidth as demonstrated. Some features may require added fees. Contact your wireless service provider for more details. Customers who want to upgrade from another phone or replace a previous-generation iPhone should check with their wireless service provider for pricing options. For those who are not qualified customers, are not eligible for an early upgrade, are purchasing an unlocked iPhone, or wish to buy an iPhone as a gift, see your carrier, an Apple Retail Store Specialist, the Apple Online Store, or an Apple Authorized Reseller for pricing. In CA and RI, sales tax is collected on the unbundled price of iPhone. Wi-Fi Internet access required for some features; fees may apply. Use constitutes acceptance of Apple's software license agreement. Warranty information is also available at [www.apple.com/legal/warranty/iphone](http://www.apple.com/legal/warranty/iphone). Unauthorized modification of your iPhone software violates the software license agreement. Inability to use an iPhone due to unauthorized modifications is not covered under your warranty.
2. Size and weight vary by configuration and manufacturing process.
3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
4. Data plan required. LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE)
5. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
6. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
7. iMovie, Pages, Numbers, and Keynote are free on the App Store for qualifying iOS 9 compatible devices with initial activation on or after September 1, 2013. GarageBand is free on the App Store for qualifying iOS 9 compatible devices with initial activation on or after September 1, 2014. See [www.apple.com/ios/whats-new](http://www.apple.com/ios/whats-new) for iOS 9 compatible devices. Downloading apps requires an Apple ID.
8. Wireless broadband recommended; fees may apply.
9. Customized suggestions based on recipient and app are not available for Chinese (Simplified, Traditional), Japanese, Korean, and Thai.

Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Application and service availability and pricing are subject to change.

Published Date: Feb 16, 2017

# iPhone 6 Plus - Technical Specifications



## Finish

- Silver
- Gold
- Space Gray

## Capacity<sup>1</sup>

- 16GB
- 64GB
- 128GB

## Weight and Dimensions<sup>2</sup>

- Height: 6.22 inches (158.1 mm)
- Width: 3.06 inches (77.8 mm)
- Depth: 0.28 inch (7.1 mm)
- Weight: 6.07 ounces (172 grams)

## Display

- Retina HD display
- 5.5-inch (diagonal) LED-backlit widescreen Multi-Touch display with IPS technology
- 1920-by-1080-pixel resolution at 401 ppi
- 1300:1 contrast ratio (typical)
- 500 cd/m<sup>2</sup> max brightness (typical)
- Full sRGB standard
- Dual-domain pixels for wide viewing angles
- Fingerprint-resistant oleophobic coating on front
- Support for display of multiple languages and characters simultaneously
- Display Zoom
- Reachability

## Chips

- A8 chip with 64-bit architecture
- M8 motion coprocessor

## iSight Camera

- 8-megapixel iSight camera with 1.5 $\mu$  pixels
- Autofocus with Focus Pixels
- *f*/2.2 aperture
- Optical image stabilization (iPhone 6 Plus only)
- True Tone flash
- Five-element lens
- Hybrid IR filter
- Backside illumination sensor

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- Sapphire crystal lens cover
- Auto image stabilization
- Auto HDR for photos
- Face detection
- Exposure control
- Panorama (up to 43 megapixels)
- Burst mode
- Tap to focus
- Photo geotagging
- Timer mode

## Video Recording

- 1080p HD video recording (30 fps or 60 fps)
- True Tone flash
- Slo-mo video (120 fps or 240 fps)
- Time-lapse video with stabilization
- Cinematic video stabilization
- Continuous autofocus video
- Take still photos while recording video
- Improved face detection
- 3x zoom
- Video geotagging

## FaceTime HD Camera

- 1.2-megapixel photos
- *f*/2.2 aperture
- 720p HD video recording
- Backside illumination sensor
- Auto HDR for photos and videos
- Face detection
- Burst mode
- Exposure control
- Timer mode

## Touch ID

- Fingerprint identity sensor built into the Home button

## Apple Pay

- Pay with your iPhone using Touch ID in stores and in apps

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1549 (GSM)\* / Model A1522 (GSM)\***
  - UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
  - GSM/EDGE (850, 900, 1800, 1900 MHz)
  - LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26, 28, 29)
- **Model A1549 (CDMA)\* / Model A1522 (CDMA)\***
  - CDMA EV-DO Rev. A and Rev. B (800, 1700/2100, 1900, 2100 MHz)
  - UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
  - GSM/EDGE (850, 900, 1800, 1900 MHz)
  - LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26, 28, 29)

### **Model A1586\* / Model A1524\***

- CDMA EV-DO Rev. A and Rev. B (800, 1700/2100, 1900, 2100 MHz)
- UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
- TD-SCDMA 1900 (F), 2000 (A)
- GSM/EDGE (850, 900, 1800, 1900 MHz)
- FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26, 28, 29)
- TD-LTE (Bands 38, 39, 40, 41)
- **All models**

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- 802.11a/b/g/n/ac Wi-Fi
- Bluetooth 4.2 wireless technology
- NFC

## Location

- Assisted GPS and GLONASS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>3</sup>

- FaceTime video
- Initiate video calls over Wi-Fi or cellular to any FaceTime-enabled device

## Audio Calling<sup>3</sup>

- FaceTime audio
- iPhone 6 to any FaceTime audio-enabled device over Wi-Fi or cellular
- Voice over LTE (VoLTE)<sup>4</sup>
- Wi-Fi calling<sup>4</sup>

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 1080p, 60 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Siri<sup>5</sup>

- Use your voice to send messages, set reminders, and more
- Get proactive suggestions
- Use hands-free
- Listen and identify songs

[Learn more about Siri](#)

## External Buttons and Connectors

- Home/Touch ID sensor
- Volume up/down
- Ring/silent
- On/off-Sleep/wake
- Microphone
- Lightning connector
- 3.5-mm stereo headphone minijack
- Built-in speaker

## Power and Battery<sup>6</sup>

- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter

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- Talk time: Up to 24 hours on 3G
- Internet use: Up to 12 hours on 3G, up to 12 hours on LTE, up to 12 hours on Wi-Fi
- HD video playback: Up to 14 hours
- Audio playback: Up to 80 hours
- Standby time: Up to 16 days

## Sensors

- Touch ID
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 9

The world's most advanced mobile operating system gets major enhancements to built-in apps, a smarter Siri and search, and much more. [Learn more about iOS 9](#)

iOS 9 includes:

- AirDrop
- AirPlay
- AirPrint
- Control Center
- Notification Center
- Siri
- Spotlight Search
- Facebook Integration
- Twitter Integration
- iCloud
- iCloud Keychain
- Multitasking
- Wallet

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Calendar
- iTunes Store
- App Store
- Notes
- News
- Contacts
- iBooks
- Game Center
- Weather
- Reminders
- Voice Memos
- Clock
- Videos
- Stocks
- Calculator
- Compass

- Podcasts
- Watch
- Tips
- iCloud Drive
- Find My iPhone
- Find My Friends

## Free Apps from Apple<sup>7</sup>

- iMovie
- Pages
- Keynote
- Numbers
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Remote

## Headphones

- Apple EarPods with Remote and Mic
- Storage and travel case

## SIM Card

- Nano-SIM

iPhone 6 Plus are not compatible with existing micro-SIM cards.

## Connector

- Lightning

## Rating for Hearing Aids

- iPhone 6 Plus (Model A1522, A1524): M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>8</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X v10.8.5 or later
- PC: Windows 7 or later
- iTunes 12.3 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

- **Language support**



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English (Australia, Canada, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **QuickType keyboard support**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Mexico, Spain), Arabic, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Marathi, Norwegian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swedish, Tamil, Telugu, Thai, Turkish, Ukrainian, Urdu, Vietnamese

- **QuickType keyboard support with predictive input<sup>9</sup>**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

- **Siri languages**

English (Australia, Canada, India, New Zealand, Singapore, UK, U.S.), Spanish (Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Norwegian (Norway), Russian (Russia), Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)

- **Dictation languages**

English (Australia, Canada, India, Ireland, New Zealand, Philippines, Singapore, South Africa, UK, U.S.), Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish (Denmark), Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew (Israel), Hungarian, Indonesian, Malaysian, Norwegian (Norway), Polish, Portuguese (Brazil, Portugal), Romanian, Russian (Russia), Slovakian, Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified), French, German, Hindi, Italian, Japanese, Korean, Spanish, Dutch, Norwegian, Portuguese (Brazil), Russian, Swedish, Thai, Turkish

- **Bilingual dictionary support**

Chinese (Simplified), French, German, Japanese, Korean, Spanish

- **Spell check**

English (Australia, Canada, UK, U.S.), French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese (Brazil, Portugal), Russian, Swedish, Turkish

## In the Box

- iPhone
- Apple EarPods with Remote and Mic
- Lightning to USB Cable
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- Documentation

## iPhone and the Environment

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- Arsenic-free display glass
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- PVC-free
- Beryllium-free
- Recyclable aluminum enclosure
- Power adapter outperforms strictest global energy efficiency standards
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## Recycling

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\*To identify your iPhone model number, see <http://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).

iPhone 6 may ship with iOS 8. iOS 9 will be available as a free download beginning September 16.

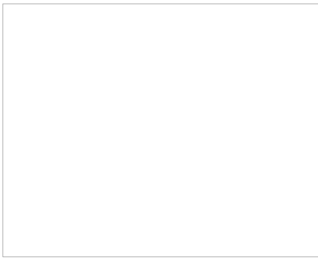
1. 1GB = 1 billion bytes; actual formatted capacity less. Requires a plan (which may include restrictions on switching service providers and roaming, even after contract expiration); sold separately to qualified customers. Credit check required; must be 18 or older. Wireless service is provided by and is the sole responsibility of your wireless service provider. Some capabilities are not available in all areas and depend on your wireless plan and service provider network. Service may not be available in all areas or at the signal strength, rates, speeds, or bandwidth as demonstrated. Some features may require added fees. Contact your wireless service provider for more details. Customers who want to upgrade from another phone or replace a previous-generation iPhone should check with their wireless service provider for pricing options. For those who are not qualified customers, are not eligible for an early upgrade, are purchasing an unlocked iPhone, or wish to buy an iPhone as a gift, see your carrier, an Apple Retail Store Specialist, the Apple Online Store, or an Apple Authorized Reseller for pricing. In CA and RI, sales tax is collected on the unbundled price of iPhone. Wi-Fi Internet access required for some features; fees may apply. Use constitutes acceptance of Apple's software license agreement. Warranty information is also available at [www.apple.com/legal/warranty/iphone](http://www.apple.com/legal/warranty/iphone). Unauthorized modification of your iPhone software violates the software license agreement. Inability to use an iPhone due to unauthorized modifications is not covered under your warranty.
2. Size and weight vary by configuration and manufacturing process.
3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
4. Data plan required. LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE)
5. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
6. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
7. iMovie, Pages, Numbers, and Keynote are free on the App Store for qualifying iOS 9 compatible devices with initial activation on or after September 1, 2013. GarageBand is free on the App Store for qualifying iOS 9 compatible devices with initial activation on or after September 1, 2014. See [www.apple.com/ios/whats-new](http://www.apple.com/ios/whats-new) for iOS 9 compatible devices. Downloading apps requires an Apple ID.
8. Wireless broadband recommended; fees may apply.
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Published Date: Apr 20, 2016

# iMac (Retina 5K, 27-inch, Late 2014) - Technical Specifications



## Display

- 27-inch (diagonal) Retina display with IPS technology;
- 5120-by-2880 resolution with support for millions of colors

## Processor

- 3.5GHz quad-core Intel Core i5 processor (Turbo Boost up to 3.9GHz)  
*Configurable to 4.0GHz quad-core Intel Core i7 (Turbo Boost up to 4.4GHz).*

## Memory

- 8GB (two 4GB) of 1600MHz DDR3 memory; four SO-DIMM slots, user accessible  
*Configurable to 16GB or 32GB.*

## Storage<sup>1</sup>

- 1TB Fusion Drive  
*Configurable to 3TB Fusion Drive or 256GB, 512GB, or 1TB of flash storage (SSD).*

## Graphics

- AMD Radeon R9 M290X graphics processor with 2GB of GDDR5 memory  
*Configurable to AMD Radeon R9 M295X with 4GB of GDDR5 memory.*

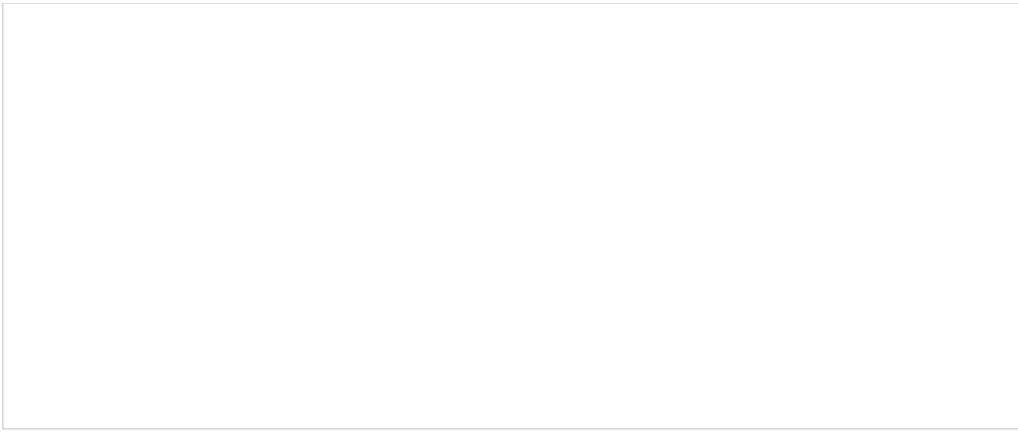
## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to 3840 by 2160 pixels on an external display
- Support for extended desktop and video mirroring modes

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone

## Connections and Expansion



- Headphone port
- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt 2 ports
  - Mini DisplayPort output
  - Support for DVI, VGA, and dual-link DVI (adapters sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Kensington lock slot

## Input

- **Apple Wireless Keyboard**  
Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- **Magic Mouse**  
Smooth, seamless Multi-Touch surface with support for simple gestures (scrolling and swiping). Click and double-click anywhere. Ambidextrous construction accommodates left- and right-handed users.
- **Magic Trackpad**  
Glass Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch and expand, swipe, three-finger swipe, four-finger swipe, tap, double-tap, rotate, screen zoom, scroll, click and drag, click drag and lock, secondary click A and B.

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Size and Weight

- **Height:** 20.3 inches (51.6 cm)
- **Width:** 25.6 inches (65.0 cm)
- **Stand depth:** 8 inches (20.3 cm)
- **Weight:** 21 pounds (9.54 kg)<sup>2</sup>

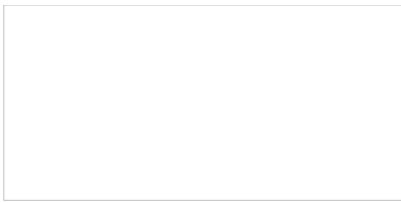
## Electrical and Operating Requirements

- **Line voltage:** 100-240V AC
- **Frequency:** 50Hz to 60Hz, single phase
- **Operating temperature:** 50° to 95° F (10° to 35° C)
- **Relative humidity:** 5% to 95% noncondensing
- **Operating altitude:** tested up to 10,000 feet

## Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer’s purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box



- iMac with Retina 5K display
- Apple Wireless Keyboard
- Apple Magic Mouse
- Power cord

## Operating System

### OS X Yosemite

Engineered to take full advantage of your Mac hardware, OS X Yosemite is intuitive and easy to use. It features an elegant design, includes enhancements to the apps you use most, and enables your Mac and iOS devices to work together in amazing ways. [Learn more](#)

#### OS X Yosemite Includes:

- AirDrop
- AirPlay
- Dictation
- Gatekeeper
- Notification Center
- Facebook Integration
- Twitter Integration
- Multiple Display Support
- Finder Tabs and Tags
- iCloud
- iCloud Keychain
- iCloud Drive
- Family Sharing
- Dashboard
- Mission Control
- Spotlight Search
- Safari Power Saver
- App Nap
- Power Nap
- Compressed Memory
- Built-in Sharing

## Built-in Apps

- iPhoto
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Maps
- iBooks
- Safari
- Mail
- FaceTime
- Messages
- Calendar
- Contacts
- Time Machine
- Photo Booth
- Mac App Store
- iTunes
- Game Center
- Preview
- Notes

- Reminders

## Configure to Order

Configure your iMac with these options, only at the [Apple Online Store](#).

Looking for an iMac with Retina 5K display you can mount on a wall or an adjustable arm? [Choose an iMac with Retina 5K display and a Built-in VESA Mount Adapter](#).

### 27-inch iMac with Retina 5K display 3.5GHz

- Magic Trackpad
- 16GB memory upgrade (two 8GB)
- 32GB memory upgrade (four 8GB)
- 3TB Fusion Drive
- 256GB, 512GB, or 1TB of flash storage (SSD)
- 4.0GHz quad-core Intel Core i7 (Turbo Boost up to 4.4GHz)
- AMD Radeon R9 M295X graphics processor with 4GB of GDDR5 memory

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iMac is designed with the following features to reduce its environmental impact:**

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>4</sup>
- Mercury-free LED-backlit display
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR Version 6.1 requirements
- Rated EPEAT Gold<sup>5</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	2.30 ( $K_v=0.25$ )	15.0
Wireless web	2.30 ( $K_v=0.25$ )	15.0
Hard drive seek	2.30 ( $K_v=0.25$ )	15.0

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 3.5GHz quad-core Intel Core i5 processor, 8GB memory, 1TB Fusion Drive, AMD Radeon R9 M290X graphics.

## Accessories and Software

### Mac Software

# 707\_iMac (Retina 5K, 27-inch, Late 2014) - Technical Specifications.pdf

- Aperture
- Logic Pro X
- Final Cut Pro X

## Adapters

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

## AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

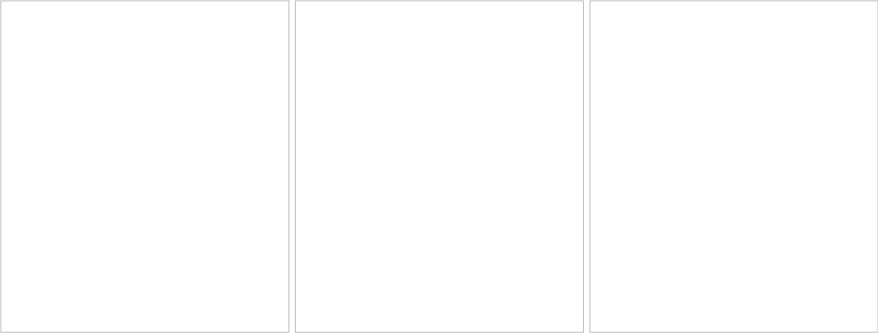
## Other Accessories

- Magic Trackpad
- Apple USB SuperDrive
- Apple Battery Charger
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS X Yosemite required. Downloading apps requires an Apple ID.
  4. PVC-free AC power cord available in all regions except India and South Korea.
  5. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 13, 2016

# iPad Air 2 - Technical Specification



## Finish

- Silver
- Gold
- Space Gray

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB
- 128GB

## Size and Weight<sup>2</sup>

- **Wi-Fi**
  - Height: 9.4 inches (240 mm)
  - Width: 6.6 inches (169.5 mm)
  - Depth: 0.24 inch (6.1 mm)
  - Weight: 0.96 pound (437 g)
- **Wi-Fi + Cellular**
  - Height: 9.4 inches (240 mm)
  - Width: 6.6 inches (169.5 mm)
  - Depth: 0.24 inch (6.1 mm)
  - Weight: 0.98 pound (444 g)

## Buttons and Connectors

- Home/Touch ID sensor
- Built-in stereo speakers
- Lightning connector
- 3.5 mm headphone jack
- Dual microphones
- On/Off - Sleep/Wake
- Volume up/down
- Nano-SIM tray (cellular models)

## Connector

- Lightning

## In the Box

- iPad Air 2
- Lightning to USB Cable
- USB Power Adapter

## Display

- Retina display



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- 9.7-inch (diagonal) LED-backlit Multi-Touch display with IPS technology
- 2048-by-1536-pixel resolution at 264 ppi
- Fingerprint-resistant oleophobic coating
- Fully laminated display
- Antireflective coating

## Chip

- A8X chip with 64-bit architecture
- M8 motion coprocessor

## iSight Camera

- 8MP iSight camera
- Autofocus
- Panorama (up to 43MP)
- Auto HDR for photos
- Exposure control
- Burst mode
- Tap to focus
- Timer mode
- *f*/2.4 aperture
- Five-element lens
- Hybrid IR filter
- Backside illumination
- Auto image stabilization
- Face detection
- Photo geotagging

## Video Recording

- 1080p HD video recording (30 fps)
- Slo-mo (120 fps)
- Time-lapse video with stabilization
- Video image stabilization
- Improved face detection
- 3x video zoom
- Video geotagging

## FaceTime HD Camera

- 1.2MP photos
- *f*/2.2 aperture
- 720p HD video recording
- Backside illumination
- Auto HDR photos and videos
- Improved face detection
- Burst mode
- Exposure control
- Timer mode

## Video Calling<sup>3</sup>

- **Wi-Fi**
  - FaceTime video
  - iPad Air to any FaceTime-enabled device over Wi-Fi
- **Wi-Fi + Cellular**
  - FaceTime video
  - iPad Air to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Calling<sup>3</sup>

- **Wi-Fi**
  - FaceTime audio
  - iPad Air to any FaceTime-enabled device over Wi-Fi

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- **Wi-Fi + Cellular**
  - FaceTime audio
  - iPad Air to any FaceTime-enabled device over Wi-Fi or cellular

## Cellular and Wireless

- **Wi-Fi model**
    - Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO
    - Bluetooth 4.2 technology
  - **Wi-Fi + Cellular model**
    - Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO
    - Bluetooth 4.2 technology
    - UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
    - CDMA EV-DO Rev. A and Rev. B (800, 1900 MHz)
    - LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26, 28, 29, 38, 39, 40, 41)<sup>4</sup>
    - Data only<sup>5</sup>
    - Wi-Fi calling<sup>4</sup>
    - Includes Apple SIM
- [Learn more about Apple SIM](#)

## SIM Card

- Nano-SIM (supports Apple SIM)

## Location

- **Wi-Fi**
  - Digital compass
  - Wi-Fi
  - iBeacon microlocation
- **Wi-Fi + Cellular**
  - Digital compass
  - Wi-Fi
  - Assisted GPS and GLONASS
  - Cellular
  - iBeacon microlocation

## Sensors

- Touch ID
- Three-axis gyro
- Accelerometer
- Barometer
- Ambient light sensor

## Touch ID

- Fingerprint identity sensor built into the Home button

## Apple Pay

- Pay with your iPad using Touch ID within apps and on the web

[Learn more about Apple Pay](#)

## Siri<sup>6</sup>

- Siri — Use your voice to send messages, set reminders, and more
- Use hands-free
- Listen and identify songs

[Learn more about Siri](#)

## Power and Battery<sup>7</sup>

# 708\_iPad Air 2 - Technical Specification.pdf

- **Wi-Fi**
  - Built-in 27.3-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- **Wi-Fi + Cellular**
  - Built-in 27.3-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Up to 9 hours of surfing the web using cellular data network
  - Charging via power adapter or USB to computer system

## Operating System

### iOS 10

With an all-new design and all-new features, iOS 10 is the world's most advanced mobile OS. It brings your iPad to life in more intelligent and expressive ways than ever. [See what's new in iOS 10](#)

iOS 10 includes:

- AirDrop
- AirPlay
- AirPrint
- Control Center
- Notification Center
- Siri
- Spotlight Search
- Apple Music
- Family Sharing
- iCloud Drive
- Multitasking
- QuickType Keyboard
- Night Shift

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPad Air 2. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Siri and Dictation
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

*Built-in apps are an essential part of your iPad experience and are efficiently designed to use less than 200MB of storage.*

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- Contacts

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- iBooks
- Home
- Reminders
- Clock
- TV
- News
- Photo Booth
- Podcasts
- Find My iPhone
- Find My Friends
- iCloud Drive

## Free Apps from Apple<sup>8</sup>

*Pages, Numbers, Keynote, iMovie, GarageBand, and iTunes U are preinstalled on iPad models with a capacity of 32GB or higher.*

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Apple Store
- Trailers
- iTunes Remote
- Music Memos

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>9</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X v10.8.5 or later
- PC: Windows 7 or later
- iTunes 12.3 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Languages

- **Language support**  
English (Australia, Canada, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **QuickType keyboard support**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Marathi, Norwegian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Turkish, Ukrainian, Urdu, Vietnamese
- **QuickType keyboard support with predictive input<sup>10</sup>**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish
- **Siri languages**  
English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Russian (Russia), Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)
- **Dictation languages**  
English (Australia, Canada, India, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, UAE, UK, U.S.),

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Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Kuwait, Saudi Arabia, Qatar, UAE), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Luxembourg, Netherlands), Finnish, Greek, Hebrew, Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovakian, Swedish, Turkish, Thai, Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese (Brazil), Russian, Spanish, Swedish, Thai, Turkish

- **Bilingual dictionary support**

Chinese (Simplified), Dutch, French, German, Italian, Japanese, Korean, Spanish

- **Spell check**

English (Australia, Canada, UK, U.S.), French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese (Brazil, Portugal), Russian, Swedish, Turkish

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- **Viewable document types**

.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

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iPad Air 2 may ship with iOS 9. iOS 10 will be available as a free download beginning September 13.

1. Available space is less and varies due to many factors. A standard configuration uses approximately 4GB to 6GB of space (including iOS and built-in apps) depending on the model and settings.
2. Size and weight vary by configuration and manufacturing process.
3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
4. Data plan required. LTE and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).
5. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
6. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
7. Testing conducted by Apple in October 2014 using preproduction iPad Air 2 units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail

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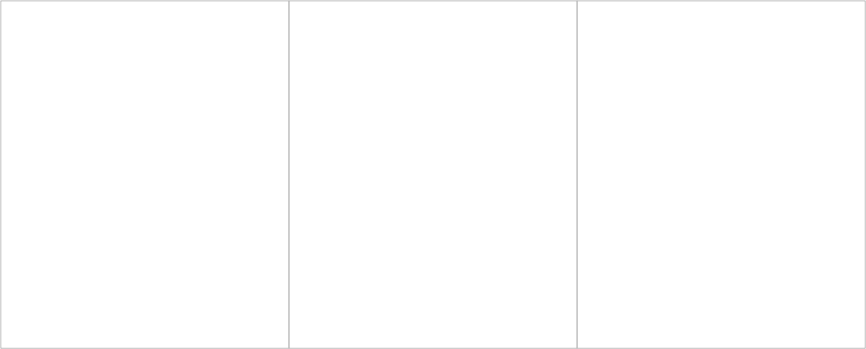
servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.

8. iMovie, Pages, Numbers, and Keynote are free on the App Store for qualifying devices with initial activation on or after September 1, 2013. GarageBand is free on the App Store for qualifying devices with initial activation on or after September 1, 2014. Downloading apps requires an Apple ID and a device that is compatible with the iOS version required for each app.
9. Wireless broadband recommended; fees may apply.
10. Customized suggestions based on recipient and app are not available for Chinese (Simplified, Traditional), Japanese, Korean, and Thai.

Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: Feb 13, 2017

# iPad mini 3 - Technical Specification



## Finish

- Silver
- Gold
- Space Gray

## Capacity<sup>1</sup>

- 16GB
- 64GB
- 128GB

## Weight and dimensions<sup>2</sup>

- **Wi-Fi**
  - Height: 7.87 inches (200 mm)
  - Width: 5.3 inches (134.7 mm)
  - Depth: 0.29 inch (7.5 mm)
  - Weight: 0.73 pound (331 g)
- **Wi-Fi + Cellular**
  - Height: 7.87 inches (200 mm)
  - Width: 5.3 inches (134.7 mm)
  - Depth: 0.29 inch (7.5 mm)
  - Weight: 0.75 pound (341 g)

## Display

- Retina display
- 7.9-inch (diagonal) LED-backlit Multi-Touch display with IPS technology
- 2048-by-1536 resolution at 326 pixels per inch (ppi)
- Fingerprint-resistant oleophobic coating

## Chip

- A7 chip with 64-bit architecture
- M7 motion coprocessor

## iSight Camera

- 5MP iSight camera
- Autofocus
- Face detection
- Backside illumination
- Five-element lens
- Hybrid IR filter
- *f*/2.4 aperture
- Tap to focus video or still images
- Tap to control exposure for video or still images
- Photo and video geotagging
- HDR photos

# 709\_iPad mini 3 - Technical Specification.pdf

- Timer mode
- Panorama

## Video Recording

- 1080p HD video recording (30 fps)
- Video stabilization
- Face detection
- Tap to focus while recording
- Backside illumination
- 3x video zoom
- Time-lapse video

## FaceTime HD Camera

- 1.2MP photos
- 720p HD video
- Face detection
- Backside illumination
- Tap to control exposure for video or still images
- Photo and video geotagging
- Panorama
- Timer mode

## Apple Pay

- Pay with your iPad using Touch ID in apps

## Touch ID

- Fingerprint identity sensor built into the Home button

## Cellular and Wireless

- **Wi-Fi**
  - Wi-Fi (802.11a/b/g/n); dual channel (2.4GHz and 5GHz) and MIMO
  - Bluetooth 4.0 technology
- **Wi-Fi + Cellular**
  - Wi-Fi (802.11a/b/g/n); dual channel (2.4GHz and 5GHz) and MIMO
  - Bluetooth 4.0 technology
  - UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)
  - CDMA EV-DO Rev. A and Rev. B (800, 1900 MHz)
  - LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26)<sup>3</sup>
  - Data only<sup>4</sup>
  - Includes Apple SIM — U.S. and UK only

## Location

- **Wi-Fi**
  - Digital compass
  - Wi-Fi
  - iBeacon microlocation
- **Wi-Fi + Cellular**
  - Digital compass
  - Wi-Fi
  - Assisted GPS and GLONASS
  - Cellular
  - iBeacon microlocation

## Video Calling<sup>5</sup>

- **Wi-Fi**
  - FaceTime video
  - iPad Air to any FaceTime-enabled device over Wi-Fi
- **Wi-Fi + Cellular**



# 709\_iPad mini 3 - Technical Specification.pdf

- FaceTime video
- iPad Air to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Calling<sup>5</sup>

- **Wi-Fi**
  - FaceTime video
  - iPad Air to any FaceTime-enabled device over Wi-Fi
- **Wi-Fi + Cellular**
  - FaceTime video
  - iPad Air to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 1080p, 60 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Intelligent Assistant<sup>6</sup>

- Siri — Use your voice to send messages, set reminders, and more
- Use hands-free
- Listen and identify songs
- [Learn more about Siri](#)

## External Buttons and Connectors

- Home/Touch ID sensor
- Built-in speaker
- Lightning connector
- Built-in speaker
- 3.5-mm stereo headphone jack
- Dual microphones
- On/Off Sleep/Wake
- Volume up/down
- Silent/Screen rotation lock

## Power and Battery<sup>7</sup>

- **Wi-Fi**
  - Built-in 23.8-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- **Wi-Fi + Cellular**
  - Built-in 23.8-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Up to 9 hours of surfing the web using cellular data network
  - Charging via power adapter or USB to computer system

## Sensors

- Touch ID
- Three-axis gyro
- Accelerometer

- Ambient light sensor

## Operating System

### iOS 8

With amazing new capabilities and updates to features you use every day, iOS 8 is the biggest iOS release ever. [Learn more about iOS 8](#)

#### iOS 8 includes:

- AirDrop
- AirPlay
- Control Center
- Family Sharing
- iCloud Drive
- iTunes Radio
- Multitasking
- Notification Center
- QuickType keyboard
- Siri
- Spotlight Search

## Built-in Apps

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- Contacts
- iBooks
- Game Center
- Reminders
- Clock
- Videos
- Newsstand
- Photo Booth
- Podcasts

## Free Apps from Apple<sup>®</sup>

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Find My iPhone
- Find My Friends
- Apple Store
- Trailers
- Remote

## Connector

- Lightning

## Mail Attachment Support

- **Viewable document types**

.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>9</sup>
- **Syncing with iTunes on a Mac or PC requires:**
  - Mac: OS X v10.6.8 or later
  - PC: Windows 8; Windows 7; Windows Vista; or Windows XP Home or Professional with Service Pack 3 or later
  - iTunes (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

- **Language support**

English (Australia, Canada, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **QuickType keyboard support**

English (Australia, Canada, India, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Canada, France, Switzerland), German (Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish, Arabic, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Greek, Hawaiian, Hebrew, Hindi, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Marathi, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swedish, Tamil, Thai, Turkish, Ukrainian, Urdu, Vietnamese

- **QuickType keyboard support with predictive input<sup>10</sup>**

English (Australia, Canada, India, UK, U.S.), Chinese (Simplified, Traditional), French (Canada, France, Switzerland), German (Germany, Switzerland), Italian, Japanese, Spanish, Portuguese (Brazil), Thai

- **Siri languages**

English (Australia, Canada, UK, U.S.), Spanish (Mexico, Spain, U.S.), French (Canada, France, Switzerland), German (Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong)

- **Dictation languages**

English (Australia, Canada, UK, U.S.), Spanish (Mexico, Spain, U.S.), French (Canada, France, Switzerland), German (Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovakian, Swedish, Turkish, Thai, Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified), French, German, Italian, Japanese, Korean, Spanish, Dutch, Portuguese (Brazil), Russian, Thai, Turkish

- **Bilingual dictionary support**

Simplified Chinese, Japanese, Korean, Spanish

- **Spell check**

English (Australia, Canada, UK, U.S.), French, German, Italian, Spanish, Danish, Dutch, Polish, Portuguese (Brazil, Portugal), Russian, Swedish, Turkish

## In The Box

- iPad mini 3
- Lightning to USB Cable
- USB Power Adapter

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1. 1GB = 1 billion bytes; actual formatted capacity less.  
2. Size and weight vary by configuration and manufacturing process.

## 709\_iPad mini 3 - Technical Specification.pdf

3. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).
4. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
5. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
6. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
7. Testing conducted by Apple in October 2014 using preproduction iPad Air 2 units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.
8. iMovie, Pages, Numbers, and Keynote are free on the App Store for qualifying iOS 8 compatible devices with initial activation on or after September 1, 2013. GarageBand is free on the App Store for qualifying iOS 8 compatible devices with initial activation on or after September 1, 2014. See [www.apple.com/ios/whats-new](http://www.apple.com/ios/whats-new) for iOS 8 compatible devices. Downloading apps requires an Apple ID.
9. Wireless broadband recommended; fees may apply.
10. Customized suggestions based on recipient and app are not available for Chinese (Simplified, Traditional) and Japanese.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Published Date: Nov 1, 2017

# iBook (16 VRAM), iBook (14.1 LCD 16 VRAM) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iBook (16 VRAM), iBook (14.1 LCD 16 VRAM) - Technical Specifications

Configurations			
Order no.	M8600LL/A	M8602LL/A	M8603LL/A
Processor	600MHz PowerPC G3	700MHz PowerPC G3	700MHz PowerPC G3
Level 2 cache	512K at 600MHz	512K at 700MHz	512K at 700MHz
System bus	100MHz	100MHz	100MHz
Memory	128MB, expandable to 640MB	128MB, expandable to 640MB	256MB, expandable to 640MB
Hard disk drive <sup>2</sup>	20GB Ultra ATA	20GB Ultra ATA	30GB Ultra ATA
Optical drive	CD-ROM	Combo (DVD-ROM/CD-RW)	Combo (DVD-ROM/CD-RW)
Display	12.1-inch (diagonal) TFT XGA	12.1-inch (diagonal) TFT XGA	14.1-inch (diagonal) TFT XGA
Graphics support	ATI Mobility Radeon with 16MB VRAM	ATI Mobility Radeon with 16MB VRAM	ATI Mobility Radeon with 16MB VRAM
FireWire	One port	One port	One port
USB	Two ports	Two ports	Two ports
VGA, S-video, and composite video output	Yes	Yes	Yes
Modem <sup>5</sup>	56K	56K	56K
Ethernet	10/100BASE-T	10/100BASE-T	10/100BASE-T
Wireless networking <sup>6</sup>	AirPort ready	AirPort ready	AirPort ready

Options	
Product	Order no.
Apple Portable Power Adapter	M8743LL/A
iBook Rechargeable Battery (12.1-inch model)	M8433G/B
iBook Rechargeable Battery (14.1-inch model)	M8665G/A
Apple Video Adapter	M8734G/A
Apple VGA Display Adapter	M8639G/A
AirPort Card	M7600LL/D
AirPort Base Station	M8209LL/A
Apple FireWire Cable (6-pin to 6-pin, 0.5 meter)	M8633G/B
Apple FireWire Cable (6-pin to 6-pin, 2 meter)	M8634G/B
Apple FireWire Cable (4-pin to 6-pin, 2 meter)	M8635G/A
AppleCare Protection Plan	M8094LL/A

## Technical Specifications

Processor and memory

- 600MHz or 700MHz PowerPC G3 processor with 512K on-chip level 2 cache running at full processor speed
- 100MHz system bus
- One of the following memory configurations:
  - 128MB of SDRAM built in
  - 256MB of SDRAM (128MB built in and 128MB in SO-DIMM slot)
- Single 1.25-inch standard SO-DIMM slot (3.3V) supports up to a 512MB SO-DIMM for a total of 640MB of SDRAM

Storage

- 20GB or 30GB Ultra ATA hard disk drive<sup>2</sup>
- One of the following optical drives:
  - 24x-speed (maximum) CD-ROM drive
  - 8x8x8x24x-speed (maximum) Combo drive (DVD-ROM/CD-RW); writes CD-R and CD-RW discs at 8x speed, reads DVD-ROM discs at 8x speed, reads CD-ROM discs at 24x speed
- Support for external FireWire and USB storage devices

Display

- Choice of built-in 12.1-inch or 14.1-inch (diagonal) TFT XGA active-matrix display
- Support for millions of colors at 1024-by-768-pixel resolution
- Support for resolution scaling to 800-by-600-pixel and 640-by-480-pixel resolution with millions of colors

Graphics support

- ATI Mobility Radeon graphics accelerator with 16MB of dedicated graphics memory and AGP 2X support

Communications

- Built-in 56K V.90 modem (RJ-11 connector)<sup>5</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and card slot for optional 11-Mbps AirPort Card; IEEE 802.11b compliant<sup>6</sup>

Peripheral connections

- Two 12-Mbps USB ports
- One 400-Mbps FireWire (IEEE 1394) port<sup>7</sup>

Audio

- 16-bit CD-quality stereo sound output minijack
- Built-in stereo speakers
- Built-in microphone
- Support for external USB audio devices such as microphones and speakers

Video

- VGA video output for video mirroring on an external display or projector (24-bit color) with included Apple VGA Display Adapter
- S-video and composite video output to TV or projector (requires Apple Video Adapter)

Battery and power

- iBook with 12.1-inch display: 47-watt-hour lithium-ion battery provides up to 5 hours of battery life on a single charge<sup>3</sup>
- iBook with 14.1-inch display: 55-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge<sup>3</sup>
- Integrated charge indicator LEDs on battery
- Power adapter port

Keyboard

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement), and embedded keypad

Trackpad

- Solid-state trackpad provides precise cursor control; supports tap, double-tap, and drag capabilities

Electrical requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Meets ENERGY STAR requirements

Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

Size and weight: iBook with 12.1-inch display

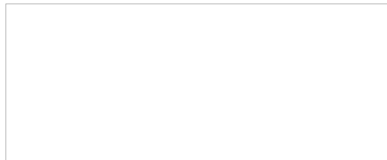
- Width: 11.2 inches (28.5 cm)
- Depth: 9.06 inches (23.0 cm)
- Thickness: 1.35 inches (3.4 cm)
- Weight: 4.9 pounds (2.2 kg)<sup>1</sup>

Size and weight: iBook with 14.1-inch display

- Width: 12.7 inches (32.3 cm)
- Depth: 10.2 inches (25.9 cm)
- Thickness: 1.35 inches (3.4 cm)
- Weight: 5.9 pounds (2.7 kg)<sup>1</sup>

1. Weight varies by configuration.  
2. 1GB = 1 billion bytes; actual formatted capacity less.  
3. Battery life depends on configuration and use.  
4. CD burning requires CD-RW drive. iTunes is for legal or right holder authorized copying only. Don't steal music.  
5. Actual modem speeds lower; speed depends on connection rate and other factors.  
6. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.  
7. Actual rates will vary.

# Mac mini (Late 2014) - Technical Specifications



## Processor

- **1.4GHz**  
1.4GHz dual-core Intel Core i5 (Turbo Boost up to 2.7GHz) with 3MB on-chip shared L3 cache
- **2.6GHz**  
2.6GHz dual-core Intel Core i5 (Turbo Boost up to 3.1GHz) with 3MB on-chip shared L3 cache  
*Configurable to 3.0GHz dual-core Intel Core i7 (Turbo Boost up to 3.5GHz) with 4MB on-chip shared L3 cache.*
- **2.8GHz**  
2.8GHz dual-core Intel Core i5 (Turbo Boost up to 3.3GHz) with 3MB on-chip shared L3 cache  
*Configurable to 3.0GHz dual-core Intel Core i7 (Turbo Boost up to 3.5GHz) with 4MB on-chip shared L3 cache.*

## Storage<sup>1</sup>

- **1.4GHz**  
500GB (5400-rpm) hard drive  
*Configurable to 1TB Fusion Drive.*
- **2.6GHz**  
1TB (5400-rpm) hard drive  
*Configurable to 1TB Fusion Drive or 256GB of flash storage (SSD).*
- **2.8GHz**  
1TB Fusion Drive  
*Configurable to 2TB Fusion Drive or 256GB, 512GB or 1TB of flash storage (SSD).*

## Memory

- **1.4GHz**  
4GB of 1600MHz LPDDR3 memory  
*Configurable to 8GB or 16GB.*
- **2.6GHz**  
8GB of 1600MHz LPDDR3 memory  
*Configurable to 16GB.*
- **2.8GHz**  
8GB of 1600MHz LPDDR3 memory  
*Configurable to 16GB.*

## Graphics

- **1.4GHz**  
Intel HD Graphics 5000
- **2.6GHz**  
Intel Iris Graphics
- **2.8GHz**  
Intel Iris Graphics

## Size

- Height: 1.4 inches (3.6 cm)
- Width: 7.7 inches (19.7 cm)
- Depth: 7.7 inches (19.7 cm)

## Weight<sup>2</sup>

- **1.4GHz**  
2.6 pounds (1.19 kg)
- **2.6GHz**  
2.6 pounds (1.20 kg)

# 710\_Mac mini (Late 2014) - Technical Specifications.pdf

- **2.8GHz**  
2.7 pounds (1.22 kg)

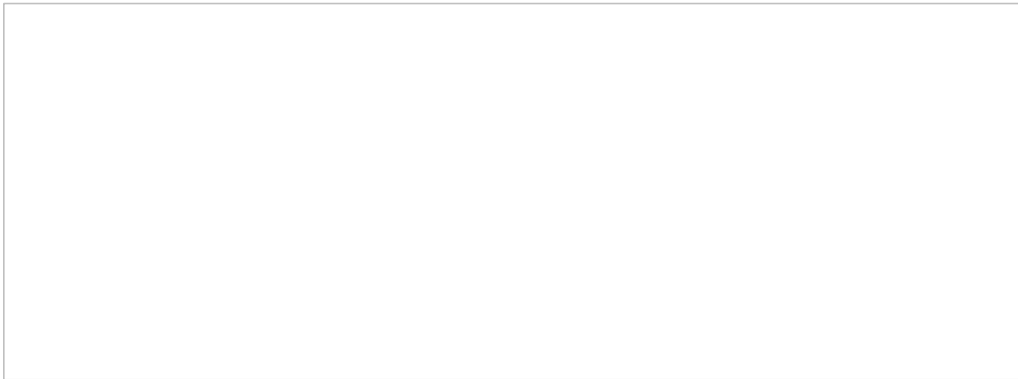
## Video Support

- Support for up to two displays at 2560 by 1600 pixels, both at millions of colors
- **Thunderbolt digital video output**
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- **HDMI video output**
  - Support for 1080p resolution at up to 60Hz
  - Support for 3840-by-2160 resolution at 30Hz
  - Support for 4096-by-2160 resolution at 24Hz
- DVI output using HDMI to DVI Adapter (sold separately)

## Audio

- Audio line in minijack (digital/analog)
- Audio line out/3.5 mm headphone jack (digital/analog)
- HDMI port supports multichannel audio output
- Support for Apple iPhone headset with microphone
- Built-in speaker

## Connections and Expansions



- Two Thunderbolt 2 ports (up to 20 Gbps)
- Four USB 3 ports (up to 5 Gbps)
- HDMI port
- SDXC card slot
- Gigabit Ethernet port
- Audio in port
- 3.5 mm headphone jack
- IR receiver

## Communications

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/g/b/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology
- **Ethernet**  
10/100/1000BASE-T Ethernet (RJ-45 connector)

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 85W
- Operating temperature: 50° to 95° F (10° to 35° C)



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- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet
- Typical acoustical performance: Sound pressure level (operator position): 12dBA at idle<sup>3</sup>

## In the Box

- Mac mini
- Power cord

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet. [Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new Mac mini. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Safari
- Mail
- Messages
- FaceTime
- Calendar
- Notes
- App Store
- iTunes
- iBooks
- Maps
- Contacts
- Reminders

## Configure to Order

Configure your Mac mini with these options, only at the [Apple Online Store](#).

- **1.4GHz**
  - 8GB LPDDR3 memory
  - 16GB LPDDR3 memory
  - 1TB Fusion Drive
  - Apple Remote
- **2.6GHz**
  - 16GB LPDDR3 memory
  - 3.0GHz dual-core Intel Core i7 processor

# 710\_Mac mini (Late 2014) - Technical Specifications.pdf

- 1TB Fusion Drive
- 256GB flash storage (SSD)
- Apple Remote
- **2.8GHz**
  - 16GB LPDDR3 memory
  - 3.0GHz dual-core Intel Core i7 processor
  - 2TB Fusion Drive
  - 256GB flash storage (SSD)
  - 512GB flash storage (SSD)
  - 1TB flash storage (SSD)
  - Apple Remote

## Mac mini and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

Mac mini is designed with the following features to reduce its environmental impact:

- BFR-free
- PVC-free<sup>5</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.90 ( $K_v = 0.25$ )	12.0
Wireless web	1.90 ( $K_v = 0.25$ )	11.5
Hard drive seek	1.95 ( $K_v = 0.25$ )	12.0

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.8GHz dual-core Intel Core i5 processor, 8GB memory, 1TB Fusion Drive, Intel Iris graphics.

## Accessories

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule
- Magic Keyboard
- Magic Mouse 2
- Magic Trackpad 2

### Mac Software

# 710\_Mac mini (Late 2014) - Technical Specifications.pdf

- Logic Pro X
- Final Cut Pro X

## Displays and Graphics

- Apple HDMI to DVI Adapter
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

## Other Accessories

- Apple USB SuperDrive
- AppleCare+ for Mac

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Acoustics measured from typical operator position sitting in front of standard Mac mini system. Acoustics may vary by configuration.
  4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  5. PVC-free AC power cord available in all regions except India and South Korea.
  6. Mac mini achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Apr 23, 2018

# OS X Yosemite - Technical Specifications

## General Requirements

- OS X v10.6.8 or later
- 2GB of memory
- 8GB of available storage

*Some features require an Apple ID; terms apply.*

*Some features require a compatible Internet service provider; fees may apply.*

## Feature Requirements

### Handoff and Instant Hotspot Supported by the following Mac models:

- MacBook Air (2012 or newer)
- MacBook Pro (2012 or newer)
- iMac (2012 or newer)
- Mac mini (2012 or newer)
- Mac Pro (Late 2013)

Handoff requires an iPhone, iPad, or iPod touch with a Lightning connector and iOS 8.

Instant Hotspot requires an iPhone or iPad with cellular connectivity with a Lightning connector and iOS 8.1. Requires Personal Hotspot service through your carrier.

### Phone Calling

Phone Calling requires an iPhone with iOS 8. Requires an activated carrier plan.

### SMS

SMS requires an iPhone with iOS 8.1. Requires an activated carrier plan.

### AirDrop

AirDrop between Mac computers and iOS devices is supported by the following Mac models:

- MacBook Air (2012 or newer)
- MacBook Pro (2012 or newer)
- iMac (2012 or newer)
- Mac mini (2012 or newer)
- Mac Pro (Late 2013)

AirDrop to iOS devices requires an iPhone, iPad, or iPod touch with a Lightning connector and iOS 7 or later.

AirDrop between two Mac computers is supported by the following Mac models:

- MacBook Pro (Late 2008 or newer)\*
- MacBook Air (Late 2010 or newer)
- MacBook (Late 2008 or newer)\*
- iMac (Early 2009 or newer)
- Mac mini (Mid 2010 or newer)
- Mac Pro (Early 2009 with AirPort Extreme card, or Mid 2010 or newer)

### Time Machine

Requires an additional hard drive or [AirPort Time Capsule](#) (sold separately).

### Photo Booth

Requires a FaceTime or iSight camera (built in or external), USB video class (UVC) camera, or FireWire DV camcorder. Backdrop effects when using a DV camcorder require fixed focus, exposure, and white balance.

### FaceTime

Video calls require a built-in FaceTime camera, an iSight camera (built in or external), a USB video class (UVC) camera, or a FireWire DV camcorder; and a 128-Kbps upstream and downstream Internet connection. Making HD video calls requires a built-in FaceTime HD camera and a 1-Mbps upstream and downstream Internet connection. Receiving HD video calls requires a supported Intel-based Mac. [Learn more](#)

# 711\_OS X Yosemite - Technical Specifications.pdf

## Boot Camp

Supports existing Boot Camp installations with Windows XP Service Pack 2, Windows Vista, or Windows 7. New Boot Camp installations require Windows 7 or Windows 8 (sold separately).

## Spotlight Suggestions

Requires a broadband Internet connection.

## Exchange Support

Requires Microsoft Exchange Server 2007 Service Pack 1 Update Rollup 4, Exchange Server 2010, or Exchange 2013. Auto-setup requires enabling the Autodiscovery feature of Microsoft Exchange Server.

## AirPlay Mirroring

Requires an Apple TV (2nd generation or later). Supported by the following Mac models:

- MacBook Pro (Early 2011 or newer)
- MacBook Air (Mid 2011 or newer)
- iMac (Mid 2011 or newer)
- Mac mini (Mid 2011 or newer)
- Mac Pro (Late 2013)

## Peer-to-Peer AirPlay

Requires a Mac (2012 or later) with OS X Yosemite and an Apple TV (3rd generation rev A, model A1469 or later) with Apple TV software 7.0 or later.

## Power Nap

Supported by the following Mac models:

- MacBook Pro with Retina display (Mid 2012 or newer)
- MacBook Air (Late 2010 or newer)
- iMac (Late 2012 or newer)
- Mac mini (Late 2012 or newer)
- Mac Pro (Late 2013)

## Gestures

Requires a Multi-Touch trackpad, Magic Trackpad, or Magic Mouse.

## VoiceOver Gestures

Requires a Multi-Touch trackpad or Magic Trackpad.

## Dictation

Requires a microphone (built in or external).

## Mac App Store

Available only to persons age 13 or older in the U.S. and many other countries. Requires compatible hardware and software and Internet access; broadband recommended (fees may apply). Terms apply.

## What's Included

### Applications

- Automator
- Calculator
- Calendar
- Chess
- Contacts
- Dashboard
- Dictionary
- DVD Player
- FaceTime

# 711\_OS X Yosemite - Technical Specifications.pdf

- Font Book
- iBooks
- Image Capture
- iTunes
- Launchpad
- Mac App Store
- Mail
- Maps
- Messages
- Mission Control
- Notes
- Photo Booth
- Preview
- QuickTime Player
- Reminders
- Safari
- Stickies
- System Preferences
- TextEdit
- Time Machine

[Learn more about built-in apps](#)

## Utilities

- Activity Monitor
- AirPort Utility
- AppleScript Editor
- Audio MIDI Setup
- Bluetooth File Exchange
- Boot Camp Assistant
- ColorSync Utility
- Console
- DigitalColor Meter
- Disk Utility
- Grab
- Grapher
- Keychain Access
- Migration Assistant
- System Information
- Terminal
- VoiceOver Utility

## Languages

- Arabic
- Catalan
- Croatian
- Simplified Chinese
- Traditional Chinese
- Czech
- Danish
- Dutch
- English
- Finnish
- French
- German
- Greek
- Hebrew
- Hungarian
- Indonesian
- Italian
- Japanese
- Korean
- Malay
- Norwegian

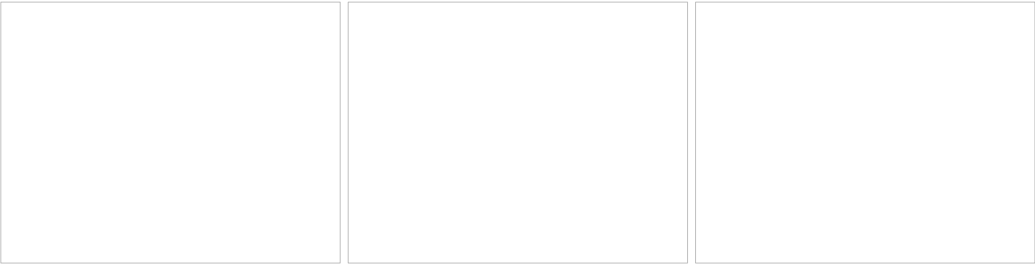
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- Polish
- Brazilian Portuguese
- Portuguese
- Romanian
- Russian
- Slovak
- Spanish
- Spanish (Mexico)
- Swedish
- Thai
- Turkish
- Ukrainian
- Vietnamese

- 
1. \*The MacBook Pro (17-inch Late 2008) and the white MacBook (Late 2008) do not support AirDrop.
  2. iCloud requires iOS 5 or later on iPhone 3GS or later, iPod touch (3rd generation or later), iPad, or iPad mini; a Mac computer with OS X Lion v10.7.5 or later; or a PC with Windows 7 or Windows 8 (Outlook 2007 or later or an up-to-date browser is required for accessing email, contacts, and calendars). Some features require iOS 8 and OS X Yosemite. Some features require a Wi-Fi connection. Some features are not available in all countries. Access to some services is limited to 10 devices.

Published Date: Jun 5, 2017

# MacBook (Retina, 12-inch, Early 2015) - Technical Specifications



## Finish

- Silver
- Gold
- Space Gray

## Display

- Retina display
- 12-inch (diagonal) LED-backlit display with IPS technology
- 2304-by-1440 resolution at 226 pixels per inch with support for millions of colors
- 16:10 aspect ratio
- Supported scaled resolutions:
  - 1440 by 900
  - 1280 by 800
  - 1024 by 640

## Processor

- **1.1GHz**  
1.1GHz dual-core Intel Core M processor (Turbo Boost up to 2.4GHz) with 4MB shared L3 cache  
*Configurable to 1.3GHz dual-core Intel Core M processor (Turbo Boost up to 2.9GHz) with 4MB shared L3 cache.*
- **1.2GHz**  
1.2GHz dual-core Intel Core M processor (Turbo Boost up to 2.6GHz) with 4MB shared L3 cache  
*Configurable to 1.3GHz dual-core Intel Core M processor (Turbo Boost up to 2.9GHz) with 4MB shared L3 cache.*

## Memory

- 8GB of 1600MHz LPDDR3 onboard memory

## Storage

- **1.1GHz**  
256GB PCIe-based onboard flash storage<sup>1</sup>
- **1.2GHz**  
512GB PCIe-based onboard flash storage<sup>1</sup>

## Size and Weight

- **Height:** 0.14–0.52 inch (0.35–1.31 cm)
- **Width:** 11.04 inches (28.05 cm)
- **Depth:** 7.74 inches (19.65 cm)
- **Weight:** 2.03 pounds (0.92 kg)<sup>2</sup>

## Graphics and Video Support

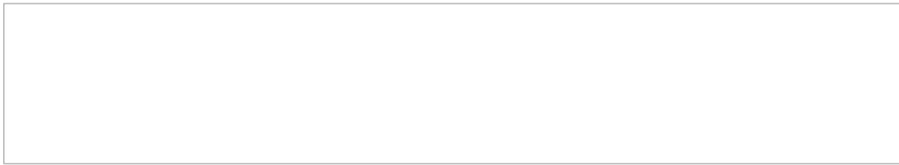
- Intel HD Graphics 5300
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 3840 by 2160 pixels on an external display, both at millions of colors

## Wireless



- **Wi-Fi**  
802.11ac Wi-Fi wireless networking;  
IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Charging and Expansion



- USB-C port with support for:
  - Charging
  - USB 3.1 Gen 1 (up to 5 Gbps)
  - Native DisplayPort 1.2 video output
  - VGA output using USB-C VGA Multiport Adapter (sold separately)
  - HDMI video output using USB-C Digital AV Multiport Adapter (sold separately)

## Camera

- 480p FaceTime camera

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack
  - Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size keyboard with 78 (U.S.) or 79 (ISO) individual LED backlit keys, including 12 function keys and 4 arrow keys with ambient light sensor
- Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Battery and Power

- Up to 9 hours wireless web<sup>3</sup>
- Up to 10 hours iTunes movie playback<sup>3</sup>
- Up to 30 days of standby time<sup>3</sup>
- Built-in 39.7-watt-hour lithium-polymer battery
- 29W USB-C Power Adapter; USB-C power port

## Electrical and Operating Requirements

- Line voltage: 100V–240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

### OS X El Capitan

Engineered to take full advantage of your Mac hardware, OS X El Capitan is designed to be as easy to use as it is beautiful to look at. It comes with an amazing collection of apps you'll use — and love — every day. And it enables your Mac and iOS devices to work wonderfully together.

[Learn more](#)

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Safari
- Mail
- Messages
- FaceTime
- Calendar
- Notes
- App Store
- iTunes
- iBooks
- Maps
- Contacts
- Reminders

[Learn more](#)

## Limited Warranty and Service

Your MacBook comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three years from your computer's purchase date. Only the [AppleCare Protection Plan](#) provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2275.

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.25 ( $K_V=0.25$ )	3.5
Wireless web	1.25 ( $K_V=0.25$ )	3.5

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_V$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_V$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 1.2GHz dual-core Intel Core M processor, 8GB memory, 512GB storage, Intel HD Graphics 5300.

## Accessories

### Adapters

- USB-C to USB Adapter
- USB-C Digital AV Multiport Adapter
- USB-C VGA Multiport Adapter

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

### Other Accessories

# 712\_MacBook (Retina, 12-inch, Early 2015) - Technical Specifications.pdf

- AppleCare Protection Plan
- Apple USB SuperDrive
- Magic Mouse
- Magic Trackpad
- World Travel Adapter Kit

## In the Box

- MacBook
- 29W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Configure to Order

Configure your MacBook to order with this option, only at the Apple Online Store.

- 1.3GHz dual-core Intel Core M processor (Turbo Boost up to 2.9GHz) with 4MB shared L3 cache

## MacBook and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook is designed with the following features to reduce its environmental impact:

- Mercury-free display
- Arsenic-free display glass
- BFR-free
- PVC-free
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR Version 6.1 requirements
- Rated EPEAT Gold<sup>5</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

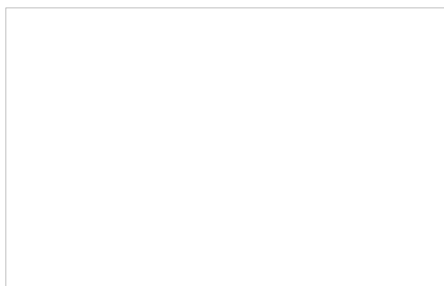
## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Testing conducted by Apple in February 2015 using preproduction 1.2GHz Intel Core M-based 12-inch MacBook systems (wireless web test and HD movie playback test) as well as preproduction 1.2GHz Intel Core M-based 12-inch MacBook systems and preproduction 1.3GHz Intel Core M-based 12-inch MacBook systems (standby test), all configured with 512GB of flash storage and 8GB of RAM. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  4. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS X Yosemite or later required. Downloading apps requires an Apple ID.
  5. MacBook achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: May 23, 2016

# MacBook Air (11-inch, Early 2015) - Technical Specifications



## Display

- 11.6-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions: 1366 by 768 (native), 1344 by 756, and 1280 by 720 pixels at 16:9 aspect ratio; 1152 by 720 and 1024 by 640 pixels at 16:10 aspect ratio; 1024 by 768 and 800 by 600 pixels at 4:3 aspect ratio

## Storage<sup>1</sup>

- **128GB**  
128GB PCIe-based flash storage
- **256GB**  
256GB PCIe-based flash storage  
*Configurable to 512GB flash storage.*

## Processor

- 1.6GHz dual-core Intel Core i5 (Turbo Boost up to 2.7GHz) with 3MB shared L3 cache  
*Configurable to 2.2GHz dual-core Intel Core i7 (Turbo Boost up to 3.2GHz) with 4MB shared L3 cache.*

## Memory

- 4GB of 1600MHz LPDDR3 onboard memory  
*Configurable to 8GB.*

## Battery and Power<sup>2</sup>

- Up to 9 hours wireless web
- Up to 10 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 38-watt-hour lithium-polymer battery
- 45W MagSafe 2 Power Adapter with cable management; MagSafe 2 power port

## Size and Weight

- **Height:** 0.11-0.68 inch (0.3-1.7 cm)
- **Width:** 11.8 inches (30 cm)
- **Depth:** 7.56 inches (19.2 cm)
- **Weight:** 2.38 pounds (1.08 kg)<sup>3</sup>

## Graphics and Video Support

- Intel HD Graphics 6000
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 3840 by 2160 pixels on an external display, both at millions of colors
- Thunderbolt digital video output
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
  - HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

## Camera

# 713\_MacBook Air (11-inch, Early 2015) - Technical Specifications.pdf

- 720p FaceTime HD camera

## Charging and Expansion

- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt 2 port (up to 20 Gbps)
- MagSafe 2 power port

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack
- Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

### OS X El Capitan

Engineered to take full advantage of your Mac hardware, OS X El Capitan is designed to be as easy to use as it is beautiful to look at. It comes with an amazing collection of apps you'll use — and love — every day. And it enables your Mac and iOS devices to work wonderfully together.

[Learn more](#)

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Safari
- Mail
- Messages
- FaceTime
- Calendar
- Notes
- App Store
- iTunes
- iBooks
- Maps

# 713\_MacBook Air (11-inch, Early 2015) - Technical Specifications.pdf

- Contacts
- Reminders

[Learn more](#)

## Limited Warranty and Service

Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.25 ( $K_V=0.25$ )	3.5
Wireless web	1.25 ( $K_V=0.25$ )	3.5

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_V$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_V$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 1.6GHz dual-core Intel Core i5 processor, 4GB memory, 256GB storage, Intel HD Graphics 6000.

## In the Box

- MacBook Air
- Power adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Air to order with these options, only at the [Apple Online Store](#):

- 2.2GHz dual-core Intel Core i7 (Turbo Boost up to 3.2GHz) with 4MB L3 cache
- 8GB memory upgrade
- 512GB of PCIe-based flash storage

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Air is designed with the following features to reduce environmental impact:

- BFR-free
- PVC-free<sup>5</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Accessories

### Mac Software

- Logic Pro X
- Final Cut Pro X

### Displays and Adapters

- Apple Thunderbolt Display
- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

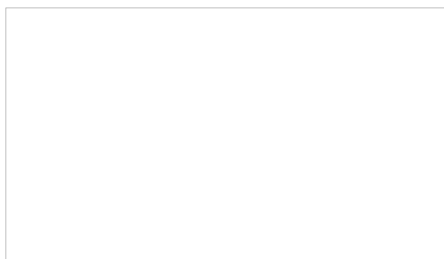
### Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 45W MagSafe 2 Power Adapter
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Testing conducted by Apple in February 2015 using preproduction 1.6GHz dual-core Intel Core i5–based 13-inch MacBook Air units and preproduction 1.6GHz dual-core Intel Core i5–based 11-inch MacBook Air units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  3. Weight varies by configuration and manufacturing process.
  4. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS X Yosemite or later required. Downloading apps requires an Apple ID.
  5. PVC-free AC power cord available in all regions except India and South Korea.
  6. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: May 23, 2016

# MacBook Air (13-inch, Early 2015) - Technical Specifications



## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions: 1440 by 900 (native), 1280 by 800, 1152 by 720, and 1024 by 640 pixels at 16:10 aspect ratio and 1024 by 768 and 800 by 600 pixels at 4:3 aspect ratio

## Storage<sup>1</sup>

- **128GB**  
128GB PCIe-based flash storage
- **256GB**  
256GB PCIe-based flash storage  
*Configurable to 512GB flash storage.*

## Processor

- 1.6GHz dual-core Intel Core i5 (Turbo Boost up to 2.7GHz) with 3MB shared L3 cache  
*Configurable to 2.2GHz dual-core Intel Core i7 (Turbo Boost up to 3.2GHz) with 4MB shared L3 cache.*

## Memory

- 4GB or 8GB of 1600MHz LPDDR3 onboard memory (8GB maximum)

## Battery and Power<sup>2</sup>

- Up to 12 hours wireless web
- Up to 12 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 54-watt-hour lithium-polymer battery
- 45W MagSafe 2 Power Adapter with cable management; MagSafe 2 power port

## Size and Weight

- **Height:** 0.11-0.68 inch (0.3-1.7 cm)
- **Width:** 12.8 inches (32.5 cm)
- **Depth:** 8.94 inches (22.7 cm)
- **Weight:** 2.96 pounds (1.35 kg)<sup>3</sup>

## Graphics and Video Support

- Intel HD Graphics 6000
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 3840 by 2160 pixels on an external display, both at millions of colors.
- Thunderbolt digital video output
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)
  - Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
  - HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

## Camera

- 720p FaceTime HD camera



## Connections and Expansion

- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt 2 port (up to 20 Gbps)
- MagSafe 2 power port
- SDXC card slot
- 3.5 mm headphone jack

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack
- Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

### macOS Sierra

macOS is the operating system that powers everything you do on a Mac. macOS Sierra introduces Siri to Mac<sup>4</sup> — along with new ways to enjoy your photos, shop more securely online, and work more seamlessly between devices. [Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Air. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Reduce Motion
- Closed Captions
- Zoom
- Siri and Dictation
- Text to Speech
- Increase Contrast
- Switch Control

## Built-in Apps<sup>5</sup>

- Photos

- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- iTunes
- iBooks
- App Store

## Limited Warranty and Service

Your MacBook Air comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box

- MacBook Air
- Power adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Air to order with these options, only at [apple.com](#):

- 2.2GHz dual-core Intel Core i7 (Turbo Boost up to 3.2GHz) with 4MB L3 cache
- 512GB of PCIe-based flash storage

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Air is designed with the following features to reduce environmental impact:

- BFR-free
- PVC-free<sup>6</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>7</sup>

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{W A,m}$ (B)	Sound Pressure Level Operator Position $L_{p A,m}$ (dB)

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.25 ( $K_v = 0.25$ )	3.5
Wireless web	1.25 ( $K_v = 0.25$ )	4.0

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 1.6GHz dual-core Intel Core i5 processor, 4GB memory, 256GB storage, Intel HD Graphics 6000.

## Accessories

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

### Mac Software

- Logic Pro X
- Final Cut Pro X

### Adapters

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

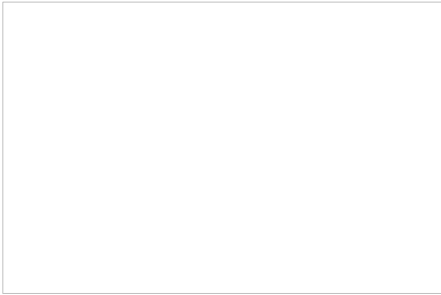
### Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 45W MagSafe 2 Power Adapter
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Testing conducted by Apple in February 2015 using preproduction 1.6GHz dual-core Intel Core i5-based 13-inch MacBook Air units. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  3. Weight varies by configuration and manufacturing process.
  4. Siri may not be available in all languages or in all areas, and features may vary by area.
  5. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. macOS Sierra required. Downloading apps requires an Apple ID.
  6. PVC-free AC power cord available in all regions except India and South Korea.
  7. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Jun 30, 2017

# MacBook Pro (Retina, 13-inch, Early 2015) - Technical Specifications



## Display

- Retina display
- 13.3-inch (diagonal) LED-backlit display with IPS technology; 2560-by-1600 native resolution at 227 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 1680 by 1050
  - 1440 by 900
  - 1024 by 640
- 300 nits brightness
- Standard color gamut (sRGB)
- 900:1 contrast ratio

## Processor

- **2.7GHz - 128GB**  
2.7GHz dual-core Intel Core i5 processor (Turbo Boost up to 3.1GHz) with 3MB shared L3 cache  
*Configurable to 2.9GHz dual-core Intel Core i5 (Turbo Boost up to 3.3GHz) with 3MB shared L3 cache or 3.1GHz dual-core Intel Core i7 (Turbo Boost up to 3.4GHz) with 4MB shared L3 cache.*
- **2.7GHz - 256GB**  
2.7GHz dual-core Intel Core i5 processor (Turbo Boost up to 3.1GHz) with 3MB shared L3 cache  
*Configurable to 2.9GHz dual-core Intel Core i5 (Turbo Boost up to 3.3GHz) with 3MB shared L3 cache or 3.1GHz dual-core Intel Core i7 (Turbo Boost up to 3.4GHz) with 4MB shared L3 cache.*
- **2.9GHz**  
2.9GHz dual-core Intel Core i5 processor (Turbo Boost up to 3.3GHz) with 3MB shared L3 cache  
*Configurable to 3.1GHz dual-core Intel Core i7 (Turbo Boost up to 3.4GHz) with 4MB shared L3 cache.*

## Memory

- 8GB of 1866MHz LPDDR3 onboard memory  
*Configurable to 16GB.*

## Storage<sup>1</sup>

- **2.7GHz - 128GB**  
128GB PCIe-based flash storage
- **2.7GHz - 256GB**  
256GB PCIe-based flash storage
- **2.9GHz**  
512GB PCIe-based flash storage  
*Configurable to 1TB flash storage.*

## Size and Weight

- **Height:** 0.71 inch (1.8 cm)
- **Width:** 12.35 inches (31.4 cm)
- **Depth:** 8.62 inches (21.9 cm)
- **Weight:** 3.48 pounds (1.58 kg)<sup>2</sup>

## Graphics and Video Support

# 715\_MacBook Pro (Retina, 13-inch, Early 2015) - Technical Specifications.pdf

- Intel Iris Graphics 6100
- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 3840 by 2160 pixels on up to two external displays, both at millions of colors.
- Thunderbolt digital video output
  - Native Mini DisplayPort output
  - DVI, VGA, dual-link DVI, and HDMI output supported using Mini DisplayPort adapters (sold separately)
- HDMI video output
  - Support for 1080p resolution at up to 60Hz
  - Support for 3840-by-2160 resolution at 30Hz
  - Support for 4096-by-2160 resolution at 24Hz

## Camera

- 720p FaceTime HD camera

## Connections and Expansion

- MagSafe 2 power port
- Two Thunderbolt 2 ports (up to 20 Gbps)
- Two USB 3 ports (up to 5 Gbps)
- HDMI port
- 3.5 mm headphone jack
- SDXC card slot
- Apple Thunderbolt to FireWire Adapter (sold separately)
- Apple Thunderbolt to Gigabit Ethernet Adapter (sold separately)

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack
  - Support for Apple iPhone headset with remote and microphone
  - Support for audio line out (digital/analog)

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Battery and Power<sup>3</sup>

- Up to 10 hours wireless web
- Up to 12 hours iTunes movie playback
- Up to 30 days of standby time
- Built-in 74.9-watt-hour lithium-polymer battery
- 60W MagSafe 2 Power Adapter with cable management system; MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet

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- Maximum shipping altitude: 35,000 feet

## Operating System

### macOS Sierra

macOS is the operating system that powers everything you do on a Mac. macOS Sierra introduces Siri to Mac<sup>4</sup> — along with new ways to enjoy your photos, shop more securely online, and work more seamlessly between devices.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>5</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## Limited Warranty and Service

Every Mac comes with a [one-year limited warranty](#) and up to 90 days of [complimentary telephone technical support](#). Extend your coverage to three years from your Mac original purchase date with the AppleCare Protection Plan. You'll get direct, one-stop access to Apple's award-winning technical support for questions about your Mac, macOS, and Apple-branded applications such as Photos, iMovie, GarageBand, Pages, Numbers, Keynote, and more. In addition, you'll get 24/7 priority access to Apple experts via chat or phone through [getsupport.apple.com](https://getsupport.apple.com). You can even get local repair service when you visit other countries around the world.

## What's in the Box

- MacBook Pro
- MagSafe 2 Power Adapter
- Power cord
- AC wall plug

## Configure to Order

Configure your MacBook Pro with these options, only at [apple.com](http://apple.com):

- Up to 3.1GHz dual-core Intel Core i7, Turbo Boost up to 3.4GHz, with 4MB shared L3 cache
- 16GB of 1866MHz LPDDR3 onboard memory
- Up to 1TB PCIe-based onboard SSD<sup>1</sup>

## MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Pro is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>6</sup>
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.25 ( $K_v = 0.25$ )	3.5
Wireless web	1.25 ( $K_v = 0.25$ )	3.5

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.9GHz dual-core Intel Core i5 processor, 8GB memory, 512GB storage, Intel Iris Graphics 6100.

## Accessories

### Mac Software

- Final Cut Pro X
- Logic Pro X

### Displays and Adapters

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

### AirPort and Wireless

- AirPort Express

# 715\_MacBook Pro (Retina, 13-inch, Early 2015) - Technical Specifications.pdf

- AirPort Extreme
- AirPort Time Capsule

## Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 60W MagSafe 2 Power Adapter
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Testing conducted by Apple in April 2015 using preproduction 2.2GHz quad-core Intel Core i7–based 15-inch MacBook Pro systems with 256GB of flash storage and 16GB of RAM. Testing conducted by Apple in February 2015 using preproduction 2.9GHz dual-core Intel Core i5–based 13-inch MacBook Pro units (wireless web test and HD movie playback test) and preproduction 2.7GHz dual-core Intel Core i5–based 13-inch MacBook Pro units (standby test). The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  4. Siri may not be available in all languages or in all areas, and features may vary by area.
  5. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  6. PVC-free AC power cord available in all regions except India and South Korea.
  7. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Sep 8, 2017



# Apple Remote Desktop 3.8 - Technical Specifications

## Asset Management

### Remote Spotlight search

- Search a remote computer, its startup disk, or a specific folder, qualified using one or more of these metadata keywords: Kind, Last Opened, Last Modified, Created, Keywords, Color, Label, Name, Contents, and Size — and filtered for specific text
- Results can be copied back to the administrator's computer, opened on remote computers, or deleted

### User History report

- Lists who has logged in to a computer, how and where they accessed it, and when they logged in and out

### Application Usage report

- Shows which applications have been used on remote systems, the number of launches, duration of the launch, and who executed the launch

### File Search report

- Search for files on groups of OS X computers using name, parent path, full path, extension, date modified, date created, actual size, size on disk, kind, invisible, version number, version string, owner, group, permissions, and locked status file attributes

### Software Version report

- Selects up to 10 applications and compares versions installed on Administrator computer with a group of OS X computers

### Software Difference report

- Compares applications, fonts, and installed packages on Administrator computer with a group of OS X computers

## System Overview

- Computer: Active Processors, Available User Memory, Boot ROM, Bus Clock Speed, Bus Data Size, CPU Speed, Serial Number, Vector Processor, L2 Cache Size, L3 Cache Size, Machine Model, Memory, Empty RAM Slots, PCI Slots Used, Processor Count, CPU Type, Sales Order Number, VM Size, Total RAM Slots
- Software: Kernel Version, System Version
- Storage: Free Disk Space, Total Disk Space, Trash Size
- AirPort: AirPort Active, AirPort Firmware Version, AirPort Hardware Address, AirPort Locale, AirPort Type, AirPort Installed, AirPort Network Channel, AirPort Network in Range, Computer to Computer, AirPort Network Name
- Modem: Modem Country, Modem Driver, Modem Firmware Version, Modem Installed, Modem Interface, Modem Model
- Network: First Ethernet Address, NetBooted, Primary IP Address, Primary Network Collisions, Primary Network Flags, Primary Network Hardware Address, Primary Network Input Errors, Primary Network Input Packets, Primary Network Output Errors, Primary Network Output Packets, Primary Network
- Display: Monitor Type, Monitor Depth, Monitor Resolution, 2nd Monitor Type, 2nd Monitor Depth, 2nd Monitor Resolution
- Devices: ATA Device Count, Firewire Device Count, Keyboard Connected, Mouse Connected, Optical Drive Type, SCSI Device Count, USB Device Count
- AppleTalk: AppleTalk Active, AppleTalk Network, AppleTalk Node, AppleTalk Zone
- Sharing: Computer Name, File Sharing, FTP Access, Remote Apple Events, Remote Login, UNIX Hostname, Web Sharing, Windows Sharing
- Preferences: Sleep Display, Sleep Hard Disk, Sleep Computer, Wake for Ethernet Access
- Printing: Printer Name, Printer Sharing, Printer Type, Printer Version
- Remote Desktop: Computer Info #1, Computer Info #2, Computer Info #3, Computer Info #4
- Lights Out Management: LOM Active, LOM Channel, LOM IPv4 Configuration, LOM IPv4 Address, LOM Subnet Mask, LOM Gateway, LOM Ethernet ID

### Storage report

- Hardware: Drive Manufacturer, Drive Model, Drive Revision, Drive Protocol, Removable, Serial Number, Logical Unit Number, Detachable
- Volume: Creation Date, Disk Name, File Count, Folder Count, Total Disk Space, Free Space, Startup Disk, UNIX Mount Point
- File System: Disk Format, Owner, Group, Permission Modes, Permissions, Write Access, Modification Date, Case Sensitive, Preserves Case

# 716\_Apple Remote Desktop 3.8 - Technical Specifications.pdf

- Backup: Journaling Capable, Journalled, Last Backup Date, Last Check Date

## FireWire Devices report

- Manufacturer, Model, Device Speed, Software Version, Firmware Version

## Network Interface report

- Network Overview: Name, Active, Primary, Configured with, Hardware Address, Interface Name, Flags
- Active Interface: Domain, Router Address, IP Address, Broadcast Address, DNS Server, Subnet Mask, IP Addresses, Broadcast Addresses, DNS Servers, Subnet Masks
- Network Statistics: Network Collisions, Network Input Errors, Network Input Packets, Network Output Errors, Network Output Packets
- Output Statistics: Output Queue Capacity, Output Queue Size, Output Queue Peak Size, Output Queue Drop Count, Output Queue Output Count, Output Queue Retry Count, Output Queue Stall Count
- Ethernet Statistics: Ethernet Alignment Errors, Ethernet FCS Errors, Ethernet Single Collision Frames, Ethernet Multiple Collision Frames, Ethernet SQE Test Errors, Ethernet Deferred Transmissions, Ethernet Late Collisions, Ethernet Excessive Collisions, Ethernet Internal MAC Transmit Errors, Ethernet Carrier Sense Errors, Ethernet Frames Too Long, Ethernet Internal MAC Receive Errors, Ethernet Chip Set, Ethernet Missed Frames, Ethernet Receiver Overruns, Ethernet Receiver Watchdog Timeouts, Ethernet Receiver Frames Too Short, Ethernet Receiver Collision Errors, Ethernet Receiver PHY Errors, Ethernet Receiver Timeouts, Ethernet Receiver Interrupts, Ethernet Receiver Resets, Ethernet Receiver Resource Errors, Ethernet Transmitter Underruns, Ethernet Transmitter Jabber Events, Ethernet Transmitter PHY Errors, Ethernet Transmitter Timeouts, Ethernet Transmitter Interrupts, Ethernet Transmitter Resets, Ethernet Transmitter Resource Errors, Ethernet Collision Frequencies

## PCI Card report

- Card Name, Card Type, Card Memory, Card Revision, Vendor ID, Device ID, ROM Version, Slot Name

## Memory report

- Slot Identifier, Module Size, Module Type, Module Speed

## USB Devices report

- Product Name, Vendor Name, Device Speed, Product ID, Vendor ID, Bus Power Amps

## Scheduling

- Schedule for specific date and time
- Set OS X computers to rebuild and send data on their hardware and software settings on a regular schedule or only as needed

## Software Distribution

### Package installation

- Install single or multiple packages remotely on a group of OS X systems
- Install packages in .pkg and .mpkg formats
- Schedule for specific dates and times
- Detect whether a package requires a restart
- Restart computer upon completion of installation or at a later time
- Encrypt data stream
- Specify network bandwidth usage

### File Copy

- Copy single or multiple files and folders to a group of OS X systems
- Copy single or multiple files and folders from a group of OS X systems to administrator's computer
- Copy single or multiple files to predefined locations: same relative location, Applications folder, current user's Desktop folder, current user's home directory, Fonts folder, Preferences folder, System folder, top folder of the disk, or a specified path
- Schedule for specific dates and times
- Choose an action if an item already exists: ask what to do, replace the item, replace if existing item is older, rename the existing item, rename the item being copied
- Set the permissions of the file once copied: inherit from destination folder, preserve current owner or user, or specify user and group
- Encrypt data stream
- Specify network bandwidth usage

## Remote Assistance

### Observe and control screens of remote Mac computers

- Support for VNC-enabled computers, including Windows and Linux systems
- Drag and drop a file from one remote computer to another
- Use remote copy and paste to quickly transfer text or images
- Adjust color depth to one of four modes: black and white, grayscale, thousands of colors, millions of colors
- Scale screens to fit in current window when viewing larger screens
- Use Curtain Mode to block a user's view while configuring sensitive information
- Take complete control or share mouse and keyboard with remote user
- Toggle between full-screen mode and fit-in-window mode
- Take screenshots

### Observe and control multiple screens of remote Mac or VNC-enabled computers simultaneously

- View up to 50 screens in a single window
- Adjust the number of screens visible on each page
- Adjust color depth to one of four modes: black and white, grayscale, thousands of colors, millions of colors
- Rotate through the list of observed computers manually or automatically
- View at-a-glance information about network computers using system status indicators

### Screen sharing and text communication

- Share a Mac screen with other OS X systems
- Send text message to a group of OS X systems
- Conduct one-to-one real-time, computer-to-computer text chat

## Remote Administration

### Manage systems remotely

- Sleep and wake a group of OS X systems
- Restart and shut down a group of OS X systems, perform restart and shut down immediately or allow users to save work
- Power on one or more OS X systems which feature Lights Out Management
- Open files and applications on a group of OS X systems
- Empty Trash for all users on one or more OS X systems
- Log out current user for one or more OS X systems

### Send UNIX commands to a group of OS X systems

- Execute commands as the current user or a specified user
- Set Network, Energy Saver, and Date & Time system preferences using command-line tools
- Use any of 30 sample UNIX scripts in the Task Template menu; add your own scripts

### Set startup disk

- Set startup disk to local disk or partition, or select from a list of NetBoot or Network Install images
- Start up multiple computers remotely
- Optionally restart computers after setting new startup disk

### Rename OS X computers

- Append a unique number for each computer when multiple computers are selected

### Change Apple Remote Desktop Client settings

- Change the Apple Remote Desktop Client settings for one or more OS X systems
- Save as a package to apply to OS X systems at a later date

## Automation

- Create powerful system administration workflows by combining Apple Remote Desktop actions
- Create end-to-end solutions by combining actions with other applications' actions

# 716\_Apple Remote Desktop 3.8 - Technical Specifications.pdf

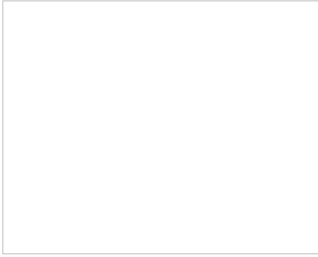
- Over 40 Automator actions
- Save Automator workflows as plug-ins

## Easy Setup

- Discover the computers you need to manage using network scanners. Create as many scanners as you need and configure each to search particular areas of your network
- Managed Preferences support for both administrator and client
- Create computer lists to organize the system however you wish — by model, location, or department, for example
- Review or reuse tasks using list of previously executed tasks
- Allow nonadministrator users to run Apple Remote Desktop with some or all features enabled
- Use a computer other than the administrator computer as a task server to automatically collect reporting data
- Define to organize groups by location, model, or department
- Define a set of rules to add computers to Smart Computer Lists automatically
- Associate computers with one of seven user-defined labels
- Use customized Computer List views to show only information of interest, including 14 additional attributes that may be chosen for display
- Authenticate clients using organization's directory services group names
- Encrypt all communications between Apple Remote Desktop and client computers with 128-bit AES encryption, or disable encryption for data-intensive tasks

Published Date: Apr 8, 2015

# iMac (Retina 5K, 27-inch, Mid 2015) - Technical Specifications



## Display

- 27-inch (diagonal) Retina display with IPS technology;
- 5120-by-2880 resolution with support for millions of colors

## Processor

- 3.3GHz quad-core Intel Core i5 processor (Turbo Boost up to 3.7GHz)

## Memory

- 8GB (two 4GB) of 1600MHz DDR3 memory (four SO-DIMM slots, user accessible)  
*Configurable to 16GB or 32GB.*

## Storage<sup>1</sup>

- 1TB (7200-rpm) hard drive  
*Configurable to 3TB hard drive, 1TB or 3TB Fusion Drive, or 256GB, 512GB, or 1TB of flash storage (SSD).*

## Graphics

- AMD Radeon R9 M290 graphics processor with 2GB of GDDR5 memory

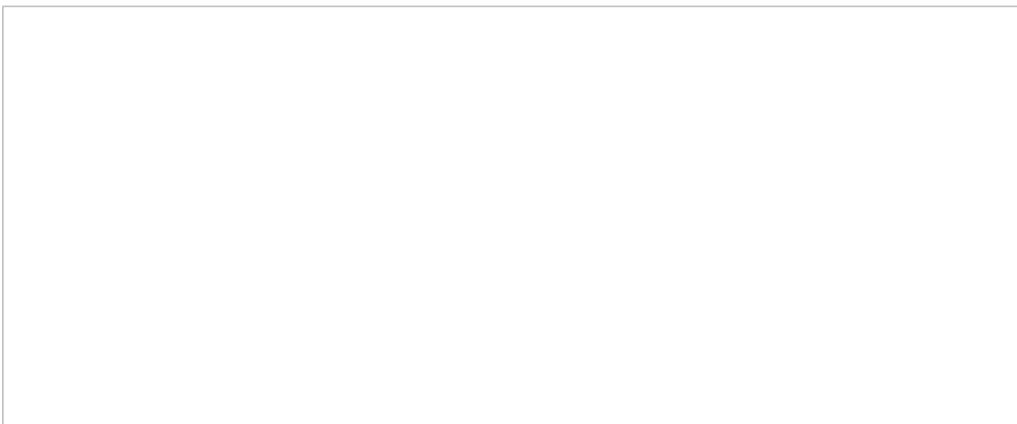
## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to 3840 by 2160 pixels on an external display
- Support for extended desktop and video mirroring modes

## Audio

- Stereo speakers
- Dual microphones
- Headphone port
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone

## Connections and Expansion



# 718\_iMac (Retina 5K, 27-inch, Mid 2015) - Technical Specifications.pdf

- Headphone port
- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt 2 ports
  - Mini DisplayPort output
  - Support for DVI, VGA, and dual-link DVI (adapters sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Kensington lock slot

## Input

- **Apple Wireless Keyboard**  
Full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- **Magic Mouse**  
Smooth, seamless Multi-Touch surface with support for simple gestures (scrolling and swiping). Click and double-click anywhere. Ambidextrous construction accommodates left- and right-handed users.
- **Magic Trackpad**  
Glass Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch and expand, swipe, three-finger swipe, four-finger swipe, tap, double-tap, rotate, screen zoom, scroll, click and drag, click drag and lock, secondary click A and B.

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Size and Weight

- **Height:** 20.3 inches (51.6 cm)
- **Width:** 25.6 inches (65.0 cm)
- **Stand depth:** 8 inches (20.3 cm)
- **Weight:** 21 pounds (9.54 kg)<sup>2</sup>

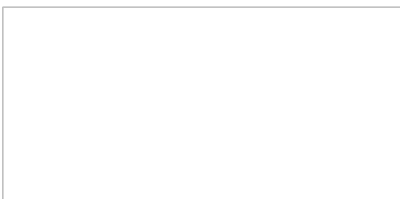
## Electrical and Operating Requirements

- **Line voltage:** 100-240V AC
- **Frequency:** 50Hz to 60Hz, single phase
- **Operating temperature:** 50° to 95° F (10° to 35° C)
- **Relative humidity:** 5% to 95% noncondensing
- **Operating altitude:** tested up to 10,000 feet

## Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer’s purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

## In the Box



- iMac with Retina 5K display
- Apple Wireless Keyboard
- Apple Magic Mouse
- Power cord

## Operating System

# 718\_iMac (Retina 5K, 27-inch, Mid 2015) - Technical Specifications.pdf

## OS X Yosemite

Engineered to take full advantage of your Mac hardware, OS X Yosemite is intuitive and easy to use. It features an elegant design, includes enhancements to the apps you use most, and enables your Mac and iOS devices to work together in amazing ways. [Learn more](#)

### OS X Yosemite Includes:

- AirDrop
- AirPlay
- Dictation
- Gatekeeper
- Notification Center
- Facebook Integration
- Twitter Integration
- Multiple Display Support
- Finder Tabs and Tags
- iCloud
- iCloud Keychain
- iCloud Drive
- Family Sharing
- Dashboard
- Mission Control
- Spotlight Search
- Safari Power Saver
- App Nap
- Power Nap
- Compressed Memory
- Built-in Sharing

## Built-in Apps<sup>3</sup>

- iPhoto
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Maps
- iBooks
- Safari
- Mail
- FaceTime
- Messages
- Calendar
- Contacts
- Time Machine
- Photo Booth
- Mac App Store
- iTunes
- Game Center
- Preview
- Notes
- Reminders

## Configure to Order

Configure your iMac with these options, only at the [Apple Online Store](#).

Looking for an iMac with Retina 5K display you can mount on a wall or an adjustable arm? [Choose an iMac with Retina 5K display and a Built-in VESA Mount Adapter](#).

### 27-inch iMac with Retina 5K display 3.5GHz

- Magic Trackpad
- 16GB memory upgrade (two 8GB)
- 32GB memory upgrade (four 8GB)

# 718\_iMac (Retina 5K, 27-inch, Mid 2015) - Technical Specifications.pdf

- 1TB or 3TB Fusion Drive
- 256GB, 512GB, or 1TB of flash storage (SSD)
- 4.0GHz quad-core Intel Core i7 (Turbo Boost up to 4.4GHz)
- AMD Radeon R9 M295X graphics processor with 4GB of GDDR5 memory

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

**iMac is designed with the following features to reduce its environmental impact:**

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>4</sup>
- Mercury-free LED-backlit display
- Highly recyclable aluminum and glass enclosures
- Meets ENERGY STAR Version 6.1 requirements
- Rated EPEAT Gold<sup>5</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

### Accessories and Software

#### Mac Software

- Aperture
- Logic Pro X
- Final Cut Pro X

#### Adapters

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter

#### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

#### Other Accessories

- Magic Trackpad
- Apple USB SuperDrive
- Apple Battery Charger
- AppleCare Protection Plan

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Pages, Numbers, and Keynote are free on the Mac App Store for qualifying Mac computers purchased on or after October 1, 2013. OS X Yosemite required. Downloading apps requires an Apple ID.
  4. PVC-free AC power cord available in all regions except India and South Korea.
  5. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Oct 13, 2016



# MacBook Pro (Retina, 15-inch, Mid 2015) - Technical Specifications



## Display

- Retina display
- 15.4-inch (diagonal) LED-backlit display with IPS technology; 2880-by-1800 native resolution at 220 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 1920 by 1200
  - 1680 by 1050
  - 1280 by 800
  - 1024 by 640
- 300 nits brightness
- Standard color gamut (sRGB)
- 900:1 contrast ratio

## Processor

- **2.2GHz**  
2.2GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.4GHz) with 6MB shared L3 cache  
*Configurable to 2.5GHz quad-core Intel Core i7 (Turbo Boost up to 3.7GHz) with 6MB shared L3 cache or 2.8GHz quad-core Intel Core i7 (Turbo Boost up to 4.0GHz) with 6MB shared L3 cache.*
- **2.5GHz**  
2.5GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.7GHz) with 6MB shared L3 cache  
*Configurable to 2.8GHz quad-core Intel Core i7 (Turbo Boost up to 4.0GHz) with 6MB shared L3 cache.*

## Memory

- 16GB of 1600MHz DDR3L onboard memory

## Storage<sup>1</sup>

- **2.2GHz - 256GB**  
256GB PCIe-based flash storage  
*Configurable to 512GB or 1TB flash storage.*
- **2.5GHz - 512GB**  
512GB PCIe-based flash storage  
*Configurable to 1TB flash storage.*

## Size and Weight

- Height: 0.71 inch (1.8 cm)
- Width: 14.13 inches (35.89 cm)
- Depth: 9.73 inches (24.71 cm)
- Weight: 4.49 pounds (2.04 kg)<sup>2</sup>

## Graphics and Video Support

- Intel Iris Pro Graphics
  - **2.2GHz - 256GB**  
Intel Iris Pro Graphics
  - **2.5GHz - 512GB**

# 719\_MacBook Pro (Retina, 15-inch, Mid 2015) - Technical Specifications.pdf

Intel Iris Pro Graphics

*AMD Radeon R9 M370X with 2GB of GDDR5 memory and automatic graphics switching*

- Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 3840 by 2160 pixels on up to two external displays, both at millions of colors
- Thunderbolt digital video output
  - Native Mini DisplayPort output
  - DVI, VGA, dual-link DVI, and HDMI output supported using Mini DisplayPort adapters (sold separately)
- HDMI video output
  - Support for 1080p resolution at up to 60Hz
  - Support for 3840-by-2160 resolution at 30Hz
  - Support for 4096-by-2160 resolution at 24Hz

## Camera

- 720p FaceTime HD camera

## Connections and Expansion



- MagSafe 2 power port
- Two Thunderbolt 2 ports (up to 20 Gbps)
- Two USB 3 ports (up to 5 Gbps)
- HDMI port
- 3.5 mm headphone jack
- SDXC card slot
- Apple Thunderbolt to FireWire Adapter (sold separately)
- Apple Thunderbolt to Gigabit Ethernet Adapter (sold separately)

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack
  - Support for Apple iPhone headset with remote and microphone
  - Support for audio line out (digital/analog)

## Keyboard and Trackpad

- Full-size backlit keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement) with ambient light sensor
- Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Battery and Power<sup>3</sup>

- Up to 9 hours wireless web
- Up to 9 hours iTunes movie playback

# 719\_MacBook Pro (Retina, 15-inch, Mid 2015) - Technical Specifications.pdf

- Up to 30 days of standby time
- Built-in 99.5-watt-hour lithium-polymer battery
- 85W MagSafe 2 Power Adapter with cable management system, MagSafe 2 power port

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## What's in the Box

# 719\_MacBook Pro (Retina, 15-inch, Mid 2015) - Technical Specifications.pdf

- MacBook Pro
- MagSafe 2 Power Adapter
- Power cord
- AC wall plug

## Configure to Order

Configure your MacBook Pro with these options, only at [apple.com](http://apple.com):

- Up to 2.8GHz quad-core Intel Core i7, Turbo Boost up to 4.0GHz, with 6MB shared L3 cache
- Up to 1TB PCIe-based SSD<sup>1</sup>

## MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Pro is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.40 ( $K_v = 0.25$ )	6.0
Wireless web	1.40 ( $K_v = 0.25$ )	6.5

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.5GHz quad-core Intel Core i7 processor, 16GB memory, 512GB storage, Intel Iris Pro, AMD Radeon R9 M370X.

## Accessories

### Mac Software

- Final Cut Pro X
- Logic Pro X

### Displays and Adapters

- Apple Mini DisplayPort to DVI Adapter

# 719\_MacBook Pro (Retina, 15-inch, Mid 2015) - Technical Specifications.pdf

- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

## AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

## Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 85W MagSafe 2 Power Adapter
- AppleCare+ for Mac

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Testing conducted by Apple in April 2015 using preproduction 2.2GHz quad-core Intel Core i7–based 15-inch MacBook Pro systems with 256GB of flash storage and 16GB of RAM. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The HD movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  5. PVC-free AC power cord available in all regions except India and South Korea.
  6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Sep 4, 2018

# iPod with touch wheel (5 GB, 10 GB, and 20 GB) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iPod with touch wheel (5 GB, 10 GB, and 20 GB) - Technical Specifications

Available Configurations (Mac)			
Order no.	M8513LL/B	M8737LL/A	M8738LL/A
Storage	5GB	10GB	20GB
Included accessories	Earbud headphones, AC adapter, FireWire cable; support for optional remote control.		
Optional accessories	FireWire cables, iPod Power Adapter, iPod Remote and Earphones, iPod Carrying Case, World Travel Adapter Kit		
Requirements and Software	Apple computer with built-in FireWire port; Mac OS 9.2.2 or Mac OS X v10.1.4 (or later); Mac OS X 10.2 (or later) recommended; CD includes iTunes 3 <sup>(1)</sup> for Mac OS X and iTunes 2 for Mac OS 9		
Documentation and Support	Electronic documentation, getting started guide, and one-year limited warranty.		

Available Configurations (PC)			
Order no.	M8697LL/A	M8740LL/A	M8741LL/A
Storage	5GB	10GB	20GB
Included accessories	Earbud headphones, AC adapter, FireWire cable; support for optional remote control; PC model includes 4-pin to 6-pin FireWire adapter.		
Optional accessories	FireWire cables, iPod Power Adapter, iPod Remote and Earphones, iPod Carrying Case, World Travel Adapter Kit		
Requirements and Software	PC with built-in FireWire or Windows-certified FireWire card; Windows Me, Windows 2000, or Windows XP Home or Professional; CD includes MUSICMATCH Jukebox Plus™ software.		
Documentation and Support	Electronic documentation, getting started guide, and one-year limited warranty.		

Other Options	
Carrying Case with Belt Clip M8781G/A	iPod Remote and Earphones set M8751G/A
World Travel Adapter Kit M8794G/A	Apple FireWire Cable (0.5 m) M8633G/A
Apple iPod Power Adapter with FireWire Cable (2 m) M8636LL/A	Apple FireWire Cable (2 m) M8634G/A

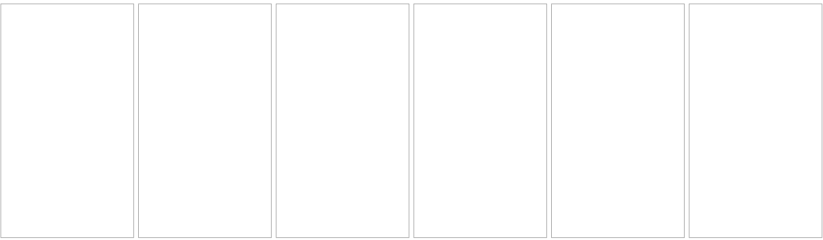
### Technical Specifications

# 71\_iPod with touch wheel (5 GB, 10 GB, and 20 GB) - Technical Specifications.pdf

<b>Capacity</b> <ul style="list-style-type: none"><li>■ 5 GB, 10 GB, or 20 GB hard disk drive<sup>(2)</sup><ul style="list-style-type: none"><li>◦ Holds over 1,000, 2,000 or 4,000 songs in 160-Kbps MP3 format<sup>(3)</sup></li><li>◦ Stores data in FireWire disk mode</li></ul></li></ul> <b>Customizable settings</b> <ul style="list-style-type: none"><li>■ Shuffle songs or albums</li><li>■ Repeat one or all</li><li>■ Sound check on or off</li><li>■ Equalizer on or off</li><li>■ Backlight timer</li><li>■ Display contrast</li><li>■ Alarms on, off, or silent</li><li>■ Sleep timer</li><li>■ Date and Time</li><li>■ Contacts sort and display by first or last names</li><li>■ Clicker on or off</li><li>■ Languages: English, French, German, Japanese, Spanish, Italian, Dutch, Danish, Norwegian, Portuguese, Finnish, Swedish, Korean, Simplified Chinese, Traditional Chinese</li></ul> <b>Display</b> <ul style="list-style-type: none"><li>■ 2-inch (diagonal) liquid crystal display with white LED backlight</li><li>■ 160-by-128-pixel resolution, 0.24-mm dot pitch</li><li>■ Support for display of multiple languages and characters simultaneously</li></ul>	<b>Size and weight (5GB model)</b> <ul style="list-style-type: none"><li>■ Height: 4.0 in</li><li>■ Width: 2.4 in</li><li>■ Depth: 0.78 in</li><li>■ Weight: 6.5 oz (185 g)</li></ul> <b>Size and weight (10GB model)</b> <ul style="list-style-type: none"><li>■ Height: 4.0 in</li><li>■ Width: 2.4 in</li><li>■ Depth: 0.72 in</li><li>■ Weight: 6.5 oz (185 g)</li></ul> <b>Size and weight (20GB model)</b> <ul style="list-style-type: none"><li>■ Height: 4.0 in</li><li>■ Width: 2.4 in</li><li>■ Depth: 0.84 in</li><li>■ Weight: 7.2 oz (204 g)</li></ul> <b>Audio</b> <ul style="list-style-type: none"><li>■ Up to 20 minutes of skip protection</li><li>■ Maximum output power: 60 mW rms (30 mW per channel)</li><li>■ Frequency response: 20 Hz to 20,000 Hz</li><li>■ Audio formats supported: MP3 (up to 320 Kbps), MP3 Variable Bit Rate (VBR), WAV, AIFF, Audible® (for Mac only)<sup>(4)</sup></li><li>■ Upgradable firmware enables support for future audio formats</li></ul> <b>Headphones</b> <ul style="list-style-type: none"><li>■ Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets</li><li>■ Frequency response: 20 to 20,000 Hz</li><li>■ Impedance: 32 ohms</li></ul>	<b>Input and output</b> <ul style="list-style-type: none"><li>■ FireWire (IEEE 1394a) port</li><li>■ 3.5-mm stereo headphone jack</li></ul> <b>Environmental requirements</b> <ul style="list-style-type: none"><li>■ Operating temperature: 32° to 95° F (0° to 35° C)</li><li>■ Non operating temperature: -4° to 113° F (-20° to 45° C)</li><li>■ Relative humidity: 5% to 95% noncondensing</li><li>■ Maximum operating altitude: 10,000 feet (3000 m)</li></ul> <b>Power and battery</b> <ul style="list-style-type: none"><li>■ Built-in rechargeable lithium polymer battery (1200 mAh)</li><li>■ Playtime: 10 hours when fully charged<sup>(5)</sup></li><li>■ Charging via FireWire connector to computer system or power adapter<ul style="list-style-type: none"><li>◦ Fast-charge time: up to 1 hour (charges to 80% of battery capacity)</li><li>◦ Full-charge time: up to 3 hours</li></ul></li></ul> <b>Power adapter</b> <ul style="list-style-type: none"><li>■ 6-pin FireWire connector</li><li>■ AC input: 100V to 240V at 0.4 amp maximum</li><li>■ Frequency: 50 to 60 Hz</li><li>■ DC output: 12V at 1 amp maximum</li></ul>
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(1) iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music  
(2) 1GB = 1 billion bytes; actual formatted capacity less.  
(3) Capacity based on an average song length of 4 minutes and 160-Kbps encoding.  
(4) Audible content available for Mac version only. Requires Internet access and Audible subscription service; fees apply.  
(5) Battery life may vary according to use.  
Product specifications are subject to change without notice.

# iPod touch (6th generation) - Technical Specifications



## Colors

- Space Gray
- Gold
- Silver
- Pink
- Blue
- Red - (PRODUCT)RED

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB
- 128GB

## Size and Weight

- Height: 4.86 inches (123.4 mm)
- Width: 2.31 inches (58.6 mm)
- Depth: 0.24 inch (6.1 mm)
- Weight: 3.10 ounces (88 grams)<sup>2</sup>

## Display

- Retina display
- 4-inch (diagonal) widescreen display with Multi-Touch IPS technology
- 1136-by-640-pixel resolution at 326 ppi
- 800:1 contrast ratio (typical)
- 500 cd/m<sup>2</sup> max brightness (typical)
- Fingerprint-resistant oleophobic coating

## Chip

- A8 chip with 64-bit architecture
- M8 motion coprocessor

## Camera

- 8MP camera
- Autofocus
- *f*/2.4 aperture
- Five-element lens
- Hybrid IR filter
- Backside illumination
- Auto image stabilization
- Auto HDR for Photos
- Improved face detection
- Exposure control
- Panorama (up to 43MP)
- Burst mode
- Tap to focus
- Photo geotagging over Wi-Fi



# 720 iPod touch (6th generation) - Technical Specifications.pdf

- Timer mode

## Video Recording

- 1080p HD video recording (30 fps)
- Tap to focus while recording
- Slo-mo video (120 fps)
- Time-lapse video
- Cinematic video stabilization
- Improved face detection
- 3x zoom
- Video geotagging over Wi-Fi

## FaceTime HD Camera

- 1.2MP photos
- *f*/2.2 aperture
- 720p HD video recording
- Backside illumination sensor
- Auto HDR for photos and videos
- Improved face detection
- Burst mode
- Exposure control
- Timer mode

## Wireless

- 802.11a/b/g/n/ac Wi-Fi
- Bluetooth 4.1 wireless technology
- Maps: Location-based service<sup>3</sup>

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV

## TV and Video

- AirPlay Mirroring and video out to Apple TV (2nd and 3rd generation)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- H.264 video up to 1080p, 30 frames per second, Main Profile level 4.1 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Intelligent Assistant<sup>4</sup>

- Siri — Use your voice to send messages, set reminders, and more
- Use hands-free
- Listen and identify songs

[Learn more about Siri](#)

## External Buttons and Connectors

- Home
- Volume up/down
- On/Off - Sleep/Wake
- 3.5 mm headphone jack
- Built-in speaker
- Lightning connector

## Input and Output

- Lightning connector
- 3.5 mm headphone jack
- Built-in speaker
- Microphone

## Power and Battery<sup>5</sup>

- Built-in rechargeable lithium-ion battery
- Music playback time: Up to 40 hours
- Video playback time: Up to 8 hours

## Sensors

- Three-axis gyro
- Accelerometer

## Operating System

### iOS 11

iOS 11 sets a new standard for the world's most advanced mobile operating system, making iPod touch more intelligent, personal, and expressive than ever.

[See what's new in iOS 11](#)

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- News
- Contacts
- iBooks
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Podcasts
- Tips
- Find My iPhone
- Find My Friends
- Settings
- Files

## Free Apps from Apple<sup>6</sup>

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.*

- iMovie

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- Pages
- Numbers
- Keynote
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips

## Headphones<sup>7</sup>

- Apple EarPods

## System Requirements

- Apple ID (required for some features)
- Internet access

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X v10.8.5 or later
- PC: Windows 7 or later
- iTunes 12.3 or later<sup>8</sup> (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

### • Language support

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • QuickType keyboard support

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

### • QuickType keyboard support with predictive input<sup>9</sup>

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

### • Siri languages

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

### • Dictation languages

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan),

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Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghainese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

- **Bilingual dictionary support**

Chinese (Simplified), Dutch, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish

- **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPod touch
- Apple EarPods
- Lightning to USB Cable
- Quick Start guide

## iPod touch and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPod touch is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Recyclable aluminum enclosure

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Apple GiveBack

Ready let go of your old iPod? Just give it to us, and we'll help you recycle it responsibly for free. Good for you. Good for the planet. [Learn more](#) about Apple GiveBack.

- 
1. Available space is less and varies due to many factors. A standard configuration uses approximately 8GB to 11GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
  2. Weight varies by configuration and manufacturing process.
  3. For iPod touch with Maps, the Maps application provides your approximate location using information based on your proximity to known Wi-Fi networks (when on and available). The more accurate the available information, the smaller the circle identifying your position on the map. The feature is not available in all areas. Known Wi-Fi networks are predominantly in urban areas. In order to provide your location, data is collected in a form that does not personally identify you. If you do not want such data collected, do not enable the feature. Not enabling the feature will not impact the functionality of your iPod touch.
  4. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required.
  5. Testing conducted by Apple in June 2015 using preproduction iPod touch hardware and software. The playlist consisted of 358 unique audio tracks purchased from the iTunes Store (256-Kbps AAC encoding); video content was purchased from the iTunes Store app on iPod touch. All settings were default except: Wi-Fi was associated with a network; the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off. Battery tests are conducted with specific iPod units; actual results may vary. Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  6. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the App Store. Downloading apps requires an Apple ID and a device that is compatible with the iOS version required for each app.
  7. Remote and mic not included.
  8. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.
  9. Customized suggestions based on recipient and app are not available for Chinese (Simplified, Traditional), Japanese, Korean, and Thai.

Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: Apr 23, 2018

# iTunes 12 for macOS - Technical Specifications

## Hardware:

- Mac computer with an Intel processor
- To play 720p HD video, an iTunes LP, or iTunes Extras, a 2.0GHz Intel Core 2 Duo or faster processor is required
- To play 1080p HD video, a 2.4GHz Intel Core 2 Duo or faster processor and 2GB of RAM is required
- Screen resolution of 1024x768 or greater; 1280x800 or greater is required to play an iTunes LP or iTunes Extras
- Internet connection to use Apple Music, the iTunes Store, and iTunes Extras
- Apple combo drive or SuperDrive to create audio, MP3, or backup CDs; some non-Apple CD-RW recorders may also work. Songs from the Apple Music catalog cannot be burned to a CD.

## Software:

- OS X version 10.10.5 or later
- 400MB of available disk space
- Apple Music, iTunes Store, and iTunes Match availability may vary by country
- Apple Music trial requires sign-up and is available for new subscribers only. Plan automatically renews after trial.

Published Date: Jan 30, 2018

# iTunes 12 for Windows - Technical Specifications

## Hardware:

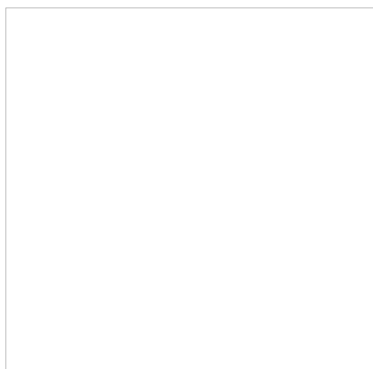
- PC with a 1GHz Intel or AMD processor with support for SSE2 and 512MB of RAM
- To play Standard Definition video from the iTunes Store, an Intel Pentium D or faster processor, 512MB of RAM, and a DirectX 9.0-compatible video card is required.
- To play 720p HD video, an iTunes LP, or iTunes Extras, a 2.0GHz Intel Core 2 Duo or faster processor, 1GB of RAM, and an Intel GMA X3000, ATI Radeon X1300, or NVIDIA GeForce 6150 or better is required.
- To play 1080p HD video, a 2.4GHz Intel Core 2 Duo or faster processor, 2GB of RAM, and an Intel GMA X4500HD; ATI Radeon HD 2400; NVIDIA GeForce 8300 GS or better is required.
- Screen resolution of 1024x768 or greater; 1280x800 or greater is required to play an iTunes LP or iTunes Extras
- 16-bit sound card and speakers
- Internet connection to use Apple Music, the iTunes Store, and iTunes Extras
- iTunes-compatible CD or DVD recorder to create audio CDs, MP3 CDs, or backup CDs or DVDs. Songs from the Apple Music catalog cannot be burned to a CD.

## Software:

- Windows 7 or later
- 64-bit editions of Windows require the iTunes 64-bit installer
- 400MB of available disk space
- Some third-party visualizers may no longer be compatible with this version of iTunes. Please contact the developer for an updated visualizer that is compatible with iTunes 12.1 or later
- Apple Music, iTunes Store, and iTunes Match availability may vary by country
- Apple Music trial requires sign-up and is available for new subscribers only. Plan automatically renews after trial or later

Published Date: Jan 30, 2018

# iPad Pro (12.9-inch) - Technical Specifications



## Finish

- Silver
- Gold
- Space Gray

## Capacity<sup>1</sup>

- **Wi-Fi models**
  - 32GB
  - 128GB
  - 256GB
- **Wi-Fi + Cellular models**
  - 128GB
  - 256GB

## Size and Weight<sup>2</sup>

- **Wi-Fi models**
  - Height: 12 inches (305.7 mm)
  - Width: 8.68 inches (220.6 mm)
  - Depth: 0.27 inch (6.9 mm)
  - Weight: 1.57 pounds (713 grams)
- **Wi-Fi + Cellular models**
  - Height: 12 inches (305.7 mm)
  - Width: 8.68 inches (220.6 mm)
  - Depth: 0.27 inch (6.9 mm)
  - Weight: 1.59 pounds (723 grams)

## Buttons and Connectors

- Built-in stereo speakers
- Lightning connector
- Home/Touch ID sensor
- Smart Connector
- 3.5 mm headphone jack
- Built-in stereo speakers
- On/Off - Sleep/Wake
- Dual microphones
- Volume up/down
- Nano-SIM tray

## In the Box

- iPad Pro
- Lightning to USB Cable
- USB Power Adapter

## Display

# 723\_iPad Pro (12.9-inch) - Technical Specifications.pdf

- **Retina display**  
12.9-inch (diagonal) LED-backlit Multi-Touch display  
2732-by-2048 resolution at 264 pixels per inch (ppi)  
Fingerprint-resistant oleophobic coating  
Fully laminated display  
Antireflective coating

## Chip

- A9X chip with 64-bit architecture
- Embedded M9 coprocessor

## Camera

- 8-megapixel camera
- Autofocus
- Panorama (up to 43 megapixels)
- HDR for photos
- Exposure control
- Burst mode
- Tap to focus
- Timer mode
- *f*/2.4 aperture
- Five-element lens
- Hybrid IR filter
- Backside illumination
- Auto image stabilization
- Face detection
- Photo geotagging

## Video Recording

- 1080p HD video recording at 30 fps
- Slo-mo video support for 720p at 120 fps
- Time-lapse video with stabilization
- Video image stabilization
- 3x video zoom
- Face detection
- Video geotagging

## FaceTime HD Camera

- 1.2-megapixel photos
- 720p HD video recording
- *f*/2.2 aperture
- HDR for photos and videos
- Backside illumination
- Exposure control
- Burst mode
- Timer mode
- Face detection

## FaceTime Calling<sup>3</sup>

- FaceTime audio to any FaceTime-enabled device over Wi-Fi or cellular
- FaceTime video to any FaceTime-enabled device over Wi-Fi or cellular

## Speakers

- Four speaker audio

## Microphones

- Dual microphones for calls, video recording, and audio recording



# 723\_iPad Pro (12.9-inch) - Technical Specifications.pdf

## Cellular and Wireless

- **All models**  
Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO  
Bluetooth 4.2 technology
- **12.9-inch iPad Pro Wi-Fi + Cellular models**  
UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)  
CDMA EV-DO Rev. A and Rev. B (800, 1900 MHz)  
LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26, 28, 29, 38, 39, 40, 41)<sup>4</sup>  
Data only<sup>5</sup>  
Wi-Fi calling<sup>4</sup>  
Includes Apple SIM<sup>6</sup>  
[Learn more about Apple SIM](#)

## SIM Card

- Nano-SIM (supports Apple SIM)

## Location

- **All models**
  - Digital compass
  - Wi-Fi
  - iBeacon microlocation
- **Wi-Fi + Cellular models**
  - Assisted GPS and GLONASS
  - Cellular

## Sensors

- Touch ID
- Three-axis gyro
- Accelerometer
- Barometer
- Ambient light sensor

## Touch ID

- Unlock iPad
- Secure personal data within apps
- Make purchases from the iTunes Store, App Store, and iBooks Store

## Apple Pay

- Pay with your iPad using Touch ID within apps and on the web

[Learn more about Apple Pay](#)

## Siri<sup>7</sup>

- Use your voice to send messages, set reminders, and more
- Get proactive suggestions
- Use your iPad hands-free
- Listen and identify songs

[Learn more about Siri](#)

## Power and Battery<sup>8</sup>

- **12.9-inch iPad Pro**
  - Built-in 38.5-watt-hour rechargeable lithium-polymer battery
- **All models**
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- **Wi-Fi + Cellular models**

# 723\_iPad Pro (12.9-inch) - Technical Specifications.pdf

- Up to 9 hours of surfing the web using cellular data network

## Operating System

### iOS 10

With an all-new design and all-new features, iOS 10 is the world's most advanced mobile OS. It brings your iPad to life in more intelligent and expressive ways than ever. [See what's new in iOS 10](#)

iOS 10 includes:

- AirDrop
- AirPlay
- AirPrint
- Control Center
- Notification Center
- Siri
- Spotlight Search
- Apple Music
- Family Sharing
- iCloud Drive
- Multitasking
- QuickType Keyboard
- Night Shift

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPad Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Siri and Dictation
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

*Built-in apps are an essential part of your iPad experience and are efficiently designed to use less than 200MB of storage.*

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- Contacts
- iBooks
- Home
- Reminders
- Clock
- TV
- Photo Booth
- Podcasts
- News

# 723\_iPad Pro (12.9-inch) - Technical Specifications.pdf

- Find My iPhone
- Find My Friends
- iCloud Drive

## Free Apps from Apple<sup>9</sup>

*Pages, Numbers, Keynote, iMovie, GarageBand, and iTunes U are preinstalled on iPad.*

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Apple Store
- Trailers
- iTunes Remote
- Music Memos
- Clips

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>10</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X 10.9.5 or later
- PC: Windows 7 or later
- iTunes 12.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Languages

- **Language support**  
English (Australia, Canada, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **QuickType keyboard support**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Marathi, Norwegian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Turkish, Ukrainian, Urdu, Vietnamese
- **QuickType keyboard support with predictive input<sup>11</sup>**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish
- **Siri languages**  
English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Russian (Russia), Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)
- **Dictation languages**  
English (Australia, Canada, India, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, UAE, UK, U.S.), Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Kuwait, Saudi Arabia, Qatar, UAE), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovakian, Swedish, Turkish, Thai, Ukrainian, Vietnamese
- **Definition dictionary support**  
English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese

# 723\_iPad Pro (12.9-inch) - Technical Specifications.pdf

(Brazil), Russian, Spanish, Swedish, Thai, Turkish

- **Bilingual dictionary support**

Chinese (Simplified), Dutch, French, German, Italian, Japanese, Korean, Spanish

- **Spell check**

English (Australia, Canada, UK, U.S.), French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese (Brazil, Portugal), Russian, Swedish, Turkish

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- **Viewable document types**

.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

---

iPad Pro may ship with iOS 9. iOS 10 will be available as a free download beginning September 13.

1. Available space is less and varies due to many factors. A standard configuration uses approximately 4GB to 6GB of space (including iOS and built-in apps) depending on the model and settings.
2. Size and weight vary by configuration and manufacturing process.
3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
4. Data plan required. LTE Advanced, LTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).
5. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
6. Embedded Apple SIM in iPad Pro (9.7-inch) may be disabled when purchased from some carriers. See your carrier for details. Apple SIM and embedded Apple SIM not available in China.
7. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
8. Testing conducted by Apple in March 2016 using preproduction iPad Pro (9.7-inch) units and software and in August 2015 using preproduction iPad Pro (12.9-inch) units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.

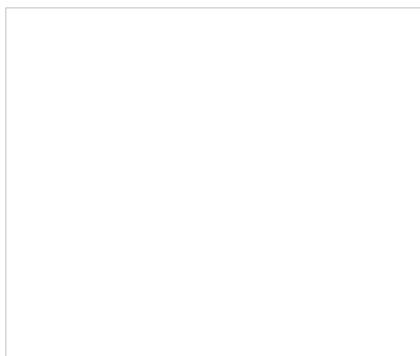
## 723\_iPad Pro (12.9-inch) - Technical Specifications.pdf

9. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the App Store. Downloading apps requires an Apple ID and a device that is compatible with the iOS version required for each app.
10. Wireless broadband recommended; fees may apply.
11. Customized suggestions based on recipient and app are not available for Chinese (Simplified, Traditional), Japanese, Korean, and Thai.

Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: Aug 7, 2018

# Apple TV (4th generation) - Technical Specifications



## Size and Weight

### Apple TV

- Height: 1.4 inches (35 mm)
- Width: 3.9 inches (98 mm)
- Depth: 3.9 inches (98 mm)
- Weight: 15 ounces (425 g)<sup>1</sup>

### Siri Remote

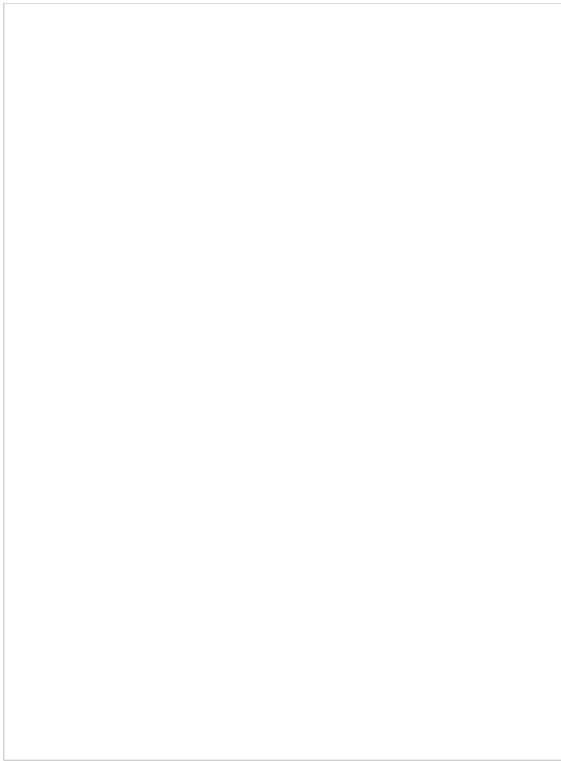
- Height: 4.88 inches (124 mm)
- Width: 1.5 inches (38 mm)
- Depth: 0.25 inch (6.3 mm)
- Weight: 1.59 ounces (45 g)<sup>1</sup>

## Capacity

- 32GB<sup>2</sup>
- 64GB<sup>2</sup>

### Siri Remote

- Bluetooth 4.0 wireless technology
- IR transmitter
- Accelerometer and three-axis gyro
- Lightning connector for charging
- Rechargeable battery providing months of battery life on a single charge (with typical daily usage)
- Charging via USB to computer system or power adapter (sold separately)



## Ports and Interfaces

- HDMI 1.4<sup>3</sup>
- 802.11ac Wi-Fi with MIMO
- 10/100BASE-T Ethernet
- Bluetooth 4.0 wireless technology
- IR receiver
- USB-C for service and support
- Built-in power supply

## Processor

- A8 chip with 64-bit architecture

## System Requirements

- iTunes purchasing and renting and Home Sharing require iTunes Store account
- Requires 802.11 wireless, Ethernet network, or Broadband Internet access
- Requires acceptance of the software license terms at [www.apple.com/legal/sla](http://www.apple.com/legal/sla)
- Requires HDMI cable (sold separately)

## Video Formats

- HEVC SDR up to 1080p, 30 fps, Main/Main 10 profile
- H.264 video up to 1080p, 60 fps, High or Main Profile level 4.2 or lower
- H.264 Baseline Profile level 3.0 or lower with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 fps, Simple Profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

## Audio Formats

- HE-AAC (V1), AAC (up to 320 Kbps), protected AAC (from iTunes Store), MP3 (up to 320 Kbps), MP3 VBR, Apple Lossless, FLAC, AIFF, and WAV; AC-3 (Dolby Digital 5.1) and E-AC-3 (Dolby Digital Plus 7.1 surround sound)

## Photo Formats

- HEIF, JPEG, GIF, TIFF

## Compatibility

# 724\_Apple TV (4th generation) - Technical Specifications.pdf

- Apple TV is compatible with HDTVs with HDMI<sup>3</sup>
- Apple TV is compatible with Bluetooth keyboards<sup>4</sup>

## Accessibility

Accessibility features help people with disabilities get the most out of their Apple TV. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can easily find and enjoy your favorite entertainment. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Bold Text
- Increase Contrast
- Reduce Motion
- Closed Caption and SDH Support
- Accessibility Shortcut
- Siri and Dictation

## In the Box

- Apple TV
- Siri Remote
- Power cord
- Lightning to USB cable
- Documentation

## Apple TV and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

Apple TV and the Siri Remote are designed with the following features to reduce their environmental impact:

### Apple TV

- BFR-free
- PVC-free<sup>5</sup>
- Meets ENERGY STAR 4.1 requirements

### Siri Remote

- Arsenic-free glass
- BFR-free
- PVC-free<sup>5</sup>
- Recyclable aluminum enclosure

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Apple GiveBack

Ready to let go of your old Apple TV? Just give it to us, and we'll help you recycle it responsibly for free. Good for you. Good for the planet. [Learn more](#) about Apple GiveBack.

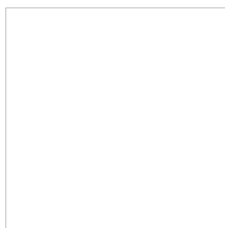
- 
1. Weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Requires HDCP when playing protected content.
  4. Compatible with Magic Keyboard and Apple Wireless Keyboard (2011). Visit <https://support.apple.com/en-us/HT201806> to find out which model you have.
  5. PVC-free worldwide except in India and Thailand, where PVC-free AC power cords are not available.

Services are not available in all countries or regions and are subject to change.

Published Date: Apr 23, 2018



# iPad mini 4 - Technical Specifications



## Finish

- Silver
- Gold
- Space Gray

## Capacity<sup>1</sup>

- **Wi-Fi models**
  - 16GB
  - 32GB
  - 64GB
  - 128GB
- **Wi-Fi + Cellular models**
  - 16GB
  - 32GB
  - 64GB
  - 128GB

## Buttons and Connectors

- Built-in stereo speakers
- Lightning connector
- Home/Touch ID sensor
- 3.5 mm headphone jack
- On/Off - Sleep/Wake
- Dual microphones
- Volume up/down
- Nano-SIM tray (cellular models)

## Weight and Dimensions<sup>2</sup>

- **Wi-Fi models**
  - Height: 8.0 inches (203.2 mm)
  - Width: 5.3 inches (134.8 mm)
  - Depth: 0.24 inch (6.1 mm)
  - Weight: 0.65 pound (298.8 grams)
- **Wi-Fi + Cellular models**
  - Height: 8.0 inches (203.2 mm)
  - Width: 5.3 inches (134.8 mm)
  - Depth: 0.24 inch (6.1 mm)
  - Weight: 0.67 pound (304 grams)

## In the Box

- iPad mini 4
- Lightning to USB Cable
- USB Power Adapter

## Display

# 725\_iPad mini 4 - Technical Specifications.pdf

- **Retina display**

7.9-inch (diagonal) LED-backlit Multi-Touch display  
2048-by-1536 resolution at 326 pixels per inch (ppi)  
Fingerprint-resistant oleophobic coating  
Fully laminated display  
Antireflective coating

## Chip

- A8 chip with 64-bit architecture
- M8 motion coprocessor

## Camera

- 8MP camera
- Autofocus
- Panorama (up to 43MP)
- Auto HDR for photos
- Exposure control
- Burst mode
- Tap to focus
- Timer mode
- *f*/2.4 aperture
- Five-element lens
- Hybrid IR filter
- Backside illumination
- Auto image stabilization
- Face detection
- Photo geotagging

## Video Recording

- 1080p HD video recording (30 fps)
- Slo-mo (120 fps)
- Time-lapse video with stabilization
- Video image stabilization
- Improved face detection
- 3x video zoom
- Video geotagging

## FaceTime HD Camera

- 1.2MP photos
- *f*/2.2 aperture
- 720p HD video recording
- Backside illumination
- Auto HDR photos and videos
- Improved face detection
- Burst mode
- Exposure control
- Timer mode

## FaceTime Calling<sup>3</sup>

- FaceTime audio to any FaceTime-enabled device over Wi-Fi or cellular
- FaceTime video to any FaceTime-enabled device over Wi-Fi or cellular

## Microphones

- Dual microphones for calls, video recording, and audio recording

## Cellular and Wireless

- **Wi-Fi models**  
Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO

# 725\_iPad mini 4 - Technical Specifications.pdf

Bluetooth 4.2 technology

- **Wi-Fi + Cellular models**

Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO

Bluetooth 4.2 technology

UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)

CDMA EV-DO Rev. A and Rev. B (800, 1900 MHz)

LTE (Bands 1, 2, 3, 4, 5, 7, 8, 13, 17, 18, 19, 20, 25, 26, 28, 29, 38, 39, 40, 41)<sup>4</sup>

Data only<sup>5</sup>

Wi-Fi calling<sup>4</sup>

Includes Apple SIM

[Learn more about Apple SIM](#)

## SIM Card

- Nano-SIM (supports Apple SIM)

## Location

- **All models**
  - Digital compass
  - Wi-Fi
  - iBeacon microlocation
- **Wi-Fi + Cellular models**
  - Assisted GPS and GLONASS
  - Cellular

## Sensors

- Touch ID
- Three-axis gyro
- Accelerometer
- Barometer
- Ambient light sensor

## Touch ID

- Unlock iPad
- Secure personal data within apps
- Make purchases from the iTunes Store, the App Store, and Apple Books

## Apple Pay

- Pay with your iPad using Touch ID within apps and on the web

[Learn more about Apple Pay](#)

## Siri<sup>6</sup>

- Use your voice to send messages, set reminders, and more
- Use your iPad hands-free
- Listen and identify songs

[Learn more about Siri](#)

## Power and Battery<sup>7</sup>

- **All models**
  - Built-in 19.1-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- **Wi-Fi + Cellular models**
  - Up to 9 hours of surfing the web using cellular data network

# 725\_iPad mini 4 - Technical Specifications.pdf

## Operating System

### iOS 12

iOS is the world's most personal and secure mobile operating system, packed with powerful features that help you get the most out of every day.

[See what's new in iOS 12](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPad mini 4. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Siri and Dictation
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- Voice Memos
- Contacts
- Books
- Home
- Reminders
- Stocks
- Clock
- TV
- Photo Booth
- Podcasts
- Measure
- News
- Find My iPhone
- Find My Friends
- Files

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled on iPad.*

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Apple Store
- Trailers
- Remote

# 725\_iPad mini 4 - Technical Specifications.pdf

- Music Memos
- Clips
- Swift Playgrounds
- Shortcuts

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>8</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X 10.9.5 or later
- PC: Windows 7 or later
- iTunes 12.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Languages

### • **Language support**

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • **QuickType keyboard support**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

### • **QuickType keyboard support with predictive input**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

### • **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

### • **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

### • **Thesaurus**

English (UK, U.S.)

### • **Bilingual dictionary support**

Arabic, Chinese (Simplified), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish

### • **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple

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Lossless, AIFF, and WAV

- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

- 
1. Available space is less and varies due to many factors. A standard configuration uses approximately 10GB to 12GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
  2. Size and weight vary by configuration and manufacturing process.
  3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
  4. Data plan required. LTE and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).
  5. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
  6. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
  7. Testing conducted by Apple in August 2015 using preproduction iPad mini 4 units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.
  8. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or regions. [Click here to see complete list.](#)

Published Date: Sep 18, 2018

# iPhone 6s - Technical Specifications



## Finish

- Rose Gold
- Gold
- Silver
- Space Gray

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB
- 128GB

## Size and Weight<sup>2</sup>

- Height: 5.44 inches (138.3 mm)
- Width: 2.64 inches (67.1 mm)
- Depth: 0.28 inch (7.1 mm)
- Weight: 5.04 ounces (143 grams)

## Display

- Retina HD display with 3D Touch
- 4.7-inch (diagonal) widescreen LCD Multi-Touch display with IPS technology
- 1334-by-750-pixel resolution at 326 ppi
- 1400:1 contrast ratio (typical)
- 500 cd/m<sup>2</sup> max brightness (typical)
- Full sRGB standard
- Dual-domain pixels for wide viewing angles
- Fingerprint-resistant oleophobic coating on front
- Support for display of multiple languages and characters simultaneously
- Display Zoom
- Reachability

## Chip

- A9 chip with 64-bit architecture
- Embedded M9 motion coprocessor

## Camera

- 12-megapixel camera
- Live Photos with stabilization
- Autofocus with Focus Pixels
- Optical image stabilization (iPhone 6s Plus only)
- True Tone flash
- Panorama (up to 63 megapixels)
- Auto HDR for photos
- Exposure control
- Burst mode

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- Timer mode
- *f*/2.2 aperture
- Five-element lens
- 5x digital zoom
- Hybrid IR filter
- Backside illumination sensor
- Sapphire crystal lens cover
- Auto image stabilization
- Local tone mapping
- Noise reduction
- Face detection
- Photo geotagging

## Video Recording

- 4K video recording at 30 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Optical image stabilization for video (iPhone 6s Plus only)
- True Tone flash
- Slo-mo video support for 1080p at 120 fps and 720p at 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Noise reduction
- Take 8-megapixel still photos while recording 4K video
- Playback zoom
- 3x digital zoom
- Face detection
- Video geotagging

## FaceTime HD Camera

- 5-megapixel photos
- 720p HD video recording
- Retina Flash
- *f*/2.2 aperture
- Auto HDR for photos and videos
- Backside illumination sensor
- Exposure control
- Burst mode
- Timer mode
- Face detection

## Touch ID

- Fingerprint sensor built into the Home button

## Apple Pay

- Pay with your iPhone using Touch ID in stores, within apps, and on the web
- Complete purchases made with Apple Pay on your Mac
- Receive and redeem rewards using rewards cards

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1633\***  
LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)  
TD-LTE (Bands 38, 39, 40, 41)  
TD-SCDMA 1900 (F), 2000 (A)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
CDMA EV-DO Rev. A (800, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)



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- **Model A1688\***  
LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29)  
TD-LTE (Bands 38, 39, 40, 41)  
TD-SCDMA 1900 (F), 2000 (A)  
CDMA EV-DO Rev. A (800, 1700/2100, 1900, 2100 MHz)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **All models**  
802.11ac Wi-Fi with MIMO  
Bluetooth 4.2 wireless technology  
NFC

## Location

- Assisted GPS, GLONASS, Galileo, and QZSS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>3</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>3</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>4</sup>
- Wi-Fi calling<sup>4</sup>

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Siri<sup>5</sup>

- Use your voice to send messages, set reminders, and more
- Get intelligent suggestions in Messages, Mail, QuickType, and more
- Activate with only your voice using “Hey Siri”
- Listen and identify songs

[Learn more about Siri](#)

## External Buttons and Connectors

- Touch ID sensor
- Volume up/down
- Ring/Silent
- On/Off - Sleep/Wake
- 3.5 mm headphone jack

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- Lightning connector
- Microphones
- Built-in speaker

## Power and Battery<sup>6</sup>

- Talk time: Up to 14 hours on 3G
- Internet use: Up to 10 hours on 3G, up to 10 hours on LTE, up to 11 hours on Wi-Fi
- HD video playback: Up to 11 hours
- Audio playback: Up to 50 hours
- Standby time: Up to 10 days
- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter

## Sensors

- Touch ID fingerprint sensor
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 11

With new features and capabilities that let you get more done quickly and easily, iOS 11 makes iPhone more powerful, personal, and intelligent than ever.

[See what's new in iOS 11](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPhone 6s. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can fully enjoy the world's most personal device. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Software TTY
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store

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- Notes
- News
- Contacts
- iBooks
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Files
- Find My iPhone
- Find My Friends
- Settings

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.*

- iMovie
- Pages
- Numbers
- Keynote
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips

## Headphones

- EarPods with 3.5 mm Headphone Plug
- Storage and travel case

## SIM Card

- Nano-SIM  
*iPhone 6s and iPhone 6s Plus are not compatible with existing micro-SIM cards.*

## Rating for Hearing Aids

- iPhone 6s (Model A1633, A1688): M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>7</sup>

Syncing with iTunes on a Mac or PC requires:

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- Mac: OS X 10.9.5 or later
- PC: Windows 7 or later
- iTunes 12.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

### • **Language support**

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • **QuickType keyboard support**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

### • **QuickType keyboard support with predictive input**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

### • **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

### • **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

### • **Bilingual dictionary support**

Chinese (Simplified), Dutch, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish

### • **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPhone with iOS 11
- EarPods with 3.5 mm Headphone Plug
- Lightning to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

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iPhone 6s and iPhone 6s Plus embody Apple's continuing environmental progress. They are designed with the following features to reduce environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Recyclable aluminum enclosure
- Power adapter outperforms strictest global energy efficiency standards
- Speaker enclosure with 30 percent post-consumer recycled plastic

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

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\* To identify your iPhone model number, see <https://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

1. Available space is less and varies due to many factors. A standard configuration uses approximately 8GB to 11GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
2. Size and weight vary by configuration and manufacturing process.
3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
4. Data plan required. LTE Advanced, LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
5. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
6. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
7. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Published Date: Jul 17, 2018

# iPhone 6s Plus - Technical Specifications



## Finish

- Rose Gold
- Gold
- Silver
- Space Gray

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB
- 128GB

## Size and Weight<sup>2</sup>

- Height: 6.23 inches (158.2 mm)
- Width: 3.07 inches (77.9 mm)
- Depth: 0.29 inch (7.3 mm)
- Weight: 6.77 ounces (192 grams)

## Display

- Retina HD display with 3D Touch
- 5.5-inch (diagonal) widescreen LCD Multi-Touch display with IPS technology
- 1920-by-1080-pixel resolution at 401 ppi
- 1300:1 contrast ratio (typical)
- 500 cd/m<sup>2</sup> max brightness (typical)
- Full sRGB standard
- Dual-domain pixels for wide viewing angles
- Fingerprint-resistant oleophobic coating on front
- Support for display of multiple languages and characters simultaneously
- Display Zoom
- Reachability

## Chip

- A9 chip with 64-bit architecture
- Embedded M9 motion coprocessor

## Camera

- 12-megapixel camera
- Live Photos with stabilization
- Autofocus with Focus Pixels
- Optical image stabilization (iPhone 6s Plus only)
- True Tone flash
- Panorama (up to 63 megapixels)
- Auto HDR for photos

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- Exposure control
- Burst mode
- Timer mode
- *f*/2.2 aperture
- Five-element lens
- 5x digital zoom
- Hybrid IR filter
- Backside illumination sensor
- Sapphire crystal lens cover
- Auto image stabilization
- Local tone mapping
- Noise reduction
- Face detection
- Photo geotagging

## Video Recording

- 4K video recording at 30 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Optical image stabilization for video (iPhone 6s Plus only)
- True Tone flash
- Slo-mo video support for 1080p at 120 fps and 720p at 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Noise reduction
- Take 8-megapixel still photos while recording 4K video
- Playback zoom
- 3x digital zoom
- Face detection
- Video geotagging

## FaceTime HD Camera

- 5-megapixel photos
- 720p HD video recording
- Retina Flash
- *f*/2.2 aperture
- Auto HDR for photos and videos
- Backside illumination sensor
- Exposure control
- Burst mode
- Timer mode
- Face detection

## Touch ID

- Fingerprint sensor built into the Home button

## Apple Pay

- Pay with your iPhone using Touch ID in stores, within apps, and on the web
- Complete purchases made with Apple Pay on your Mac
- Receive and redeem rewards using rewards cards

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1634\***  
LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)  
TD-LTE (Bands 38, 39, 40, 41)  
TD-SCDMA 1900 (F), 2000 (A)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)

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CDMA EV-DO Rev. A (800, 1700/2100, 1900, 2100 MHz)

GSM/EDGE (850, 900, 1800, 1900 MHz)

- **Model A1687\***

LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29)

TD-LTE (Bands 38, 39, 40, 41)

TD-SCDMA 1900 (F), 2000 (A)

CDMA EV-DO Rev. A (800, 1700/2100, 1900, 2100 MHz)

UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)

GSM/EDGE (850, 900, 1800, 1900 MHz)

- **All models**

802.11ac Wi-Fi with MIMO

Bluetooth 4.2 wireless technology

NFC

## Location

- Assisted GPS, GLONASS, Galileo, and QZSS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>3</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>3</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>4</sup>
- Wi-Fi calling<sup>4</sup>

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Siri<sup>5</sup>

- Use your voice to send messages, set reminders, and more
- Get intelligent suggestions in Messages, Mail, QuickType, and more
- Activate with only your voice using “Hey Siri”
- Listen and identify songs

[Learn more about Siri](#)

## External Buttons and Connectors

- Touch ID sensor
- Volume up/down
- Ring/Silent



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- On/Off - Sleep/Wake
- 3.5 mm headphone jack
- Lightning connector
- Microphones
- Built-in speaker

## Power and Battery<sup>6</sup>

- Talk time: Up to 24 hours on 3G
- Internet use: Up to 12 hours on 3G, up to 12 hours on LTE, up to 12 hours on Wi-Fi
- HD video playback: Up to 14 hours
- Audio playback: Up to 80 hours
- Standby time: Up to 16 days
- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter

## Sensors

- Touch ID fingerprint sensor
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 11

With new features and capabilities that let you get more done quickly and easily, iOS 11 makes iPhone more powerful, personal, and intelligent than ever.

[See what's new in iOS 11](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPhone 6s. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can fully enjoy the world's most personal device. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Software TTY
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Siri
- Calendar

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- iTunes Store
- App Store
- Notes
- News
- Contacts
- iBooks
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Files
- Find My iPhone
- Find My Friends
- Settings

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.*

- iMovie
- Pages
- Numbers
- Keynote
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips

## Headphones

- EarPods with 3.5 mm Headphone Plug
- Storage and travel case

## SIM Card

- Nano-SIM  
*iPhone 6s and iPhone 6s Plus are not compatible with existing micro-SIM cards.*

## Rating for Hearing Aids

- iPhone 6s Plus (Model A1634, A1687): M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>7</sup>

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Syncing with iTunes on a Mac or PC requires:

- Mac: OS X 10.9.5 or later
- PC: Windows 7 or later
- iTunes 12.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

### • Language support

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • QuickType keyboard support

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

### • QuickType keyboard support with predictive input

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

### • Siri languages

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

### • Dictation languages

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • Definition dictionary support

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

### • Bilingual dictionary support

Chinese (Simplified), Dutch, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish

### • Spell check

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPhone with iOS 11
- EarPods with 3.5 mm Headphone Plug
- Lightning to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

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Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPhone 6s and iPhone 6s Plus embody Apple's continuing environmental progress. They are designed with the following features to reduce environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Recyclable aluminum enclosure
- Power adapter outperforms strictest global energy efficiency standards
- Speaker enclosure with 30 percent post-consumer recycled plastic

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

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\* To identify your iPhone model number, see <https://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

1. Available space is less and varies due to many factors. A standard configuration uses approximately 8GB to 11GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
2. Size and weight vary by configuration and manufacturing process.
3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
4. Data plan required. LTE Advanced, LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
5. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
6. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
7. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: Jul 17, 2018

# OS X El Capitan - Technical Specifications

## General Requirements

- OS X v10.6.8 or later
- 2GB of memory
- 8.8GB of available storage
- Some features require an Apple ID; terms apply.
- Some features require a compatible Internet service provider; fees may apply.

## Mac Hardware Requirements

For details about your Mac model, click the Apple icon at the top left of your screen, choose About This Mac, then choose More Info. These Mac models are compatible with OS X El Capitan:

- MacBook (Early 2015)
- MacBook (Late 2008 Aluminum, or Early 2009 or newer)
- MacBook Pro (Mid/Late 2007 or newer)
- MacBook Air (Late 2008 or newer)
- Mac mini (Early 2009 or newer)
- iMac (Mid 2007 or newer)
- Mac Pro (Early 2008 or newer)
- Xserve (Early 2009)

## Feature Requirements

### Handoff and Instant Hotspot

Supported by the following Mac models:

- MacBook (Early 2015)
- MacBook Pro (2012 or newer)
- MacBook Air (2012 or newer)
- Mac mini (2012 or newer)
- iMac (2012 or newer)
- Mac Pro (Late 2013)

Handoff requires an iPhone, iPad, or iPod touch with a Lightning connector and iOS 8 or later.

Instant Hotspot requires an iPhone or iPad with cellular connectivity with a Lightning connector and iOS 8.1 or later. Requires Personal Hotspot service through your carrier.

### Phone Calling

Phone calling requires an iPhone with iOS 8 or later and an activated carrier plan.

### SMS

SMS requires an iPhone with iOS 8.1 or later and an activated carrier plan.

### AirDrop

AirDrop between Mac computers and iOS devices is supported by the following Mac models:

- MacBook (Early 2015)
- MacBook Pro (2012 or newer)
- MacBook Air (2012 or newer)
- Mac mini (2012 or newer)
- iMac (2012 or newer)
- Mac Pro (Late 2013)

AirDrop to iOS devices requires an iPhone, iPad, or iPod touch with a Lightning connector and iOS 7 or later.

AirDrop between two Mac computers is supported by the following Mac models:

- MacBook (Early 2015)
- MacBook (Late 2008 Aluminum or newer)\*
- MacBook Pro (Late 2008 or newer)\*
- MacBook Air (Late 2010 or newer)
- Mac mini (Mid 2010 or newer)
- iMac (Early 2009 or newer)
- Mac Pro (Early 2009 with AirPort Extreme card, or Mid 2010 or newer)

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## Time Machine

Requires an additional hard drive or [AirPort Time Capsule](#) (sold separately).

## Metal

Supported by the following Mac models:

- MacBook (Early 2015)
- MacBook Pro (Mid 2012 or newer)
- MacBook Air (Mid 2012 or newer)
- Mac mini (Late 2012 or newer)
- iMac (Late 2012 or newer)
- Mac Pro (Late 2013 and newer)

## Photo Booth

Requires a FaceTime or iSight camera (built in or external), USB video class (UVC) camera, or FireWire DV camcorder.

## FaceTime

Video calls require a built-in FaceTime camera, an iSight camera (built in or external), a USB video class (UVC) camera, or a FireWire DV camcorder; and broadband Internet connection.

[Learn more](#)

## Boot Camp

Supports existing Boot Camp installations with Windows XP Service Pack 2, Windows Vista, Windows 7, Windows 8, or Windows 10. New Boot Camp installations require Windows 8 or Windows 10 (sold separately).

## Exchange Support

Requires Microsoft Exchange Server 2007 Service Pack 1 Update Rollup 4, Exchange Server 2010, or Exchange 2013. Auto-setup requires enabling the Autodiscovery feature of Microsoft Exchange Server.

## Spotlight Suggestions

Requires a broadband Internet connection.

## AirPlay

AirPlay Mirroring requires an Apple TV (2nd generation or later). Supported by the following Mac models:

- MacBook (Early 2015)
- MacBook Pro (Early 2011 or newer)
- MacBook Air (Mid 2011 or newer)
- Mac mini (Mid 2011 or newer)
- iMac (Mid 2011 or newer)
- Mac Pro (Late 2013)

AirPlay for web video requires an Apple TV (2nd generation or later).

Peer-to-Peer AirPlay requires a Mac (2012 or later) with OS X Yosemite or later and an Apple TV (3rd generation rev A, model A1469 or later) with Apple TV software 7.0 or later.

## Power Nap

Supported by the following Mac models:

- MacBook (Early 2015)
- MacBook Pro with Retina display (Mid 2012 or newer)
- MacBook Air (Late 2010 or newer)
- Mac mini (Late 2012 or newer)
- iMac (Late 2012 or newer)
- Mac Pro (Late 2013)

## Gestures

Requires a Multi-Touch trackpad, Force Touch trackpad, Magic Trackpad, or Magic Mouse.

Force Touch gestures require a Force Touch trackpad.

VoiceOver gestures require a Multi-Touch trackpad, Force Touch trackpad, or Magic Trackpad.

## Dictation

Dictation requires a microphone (built in or external).

## Mac App Store

Available only to persons age 13 or older in the U.S. and many other countries.

## What's Included

## Applications

- Automator
- Calculator
- Calendar
- Chess
- Contacts
- Dashboard
- Dictionary
- DVD Player
- FaceTime
- Font Book
- iBooks
- Image Capture
- iTunes
- Launchpad
- Mac App Store
- Mail
- Maps
- Messages
- Mission Control
- Notes
- Photo Booth
- Photos
- Preview
- QuickTime Player
- Reminders
- Safari
- Stickies
- System Preferences
- TextEdit
- Time Machine

[Learn more about built-in apps](#)

## Utilities

- Activity Monitor
- AirPort Utility
- AppleScript Editor
- Audio MIDI Setup
- Bluetooth File Exchange
- Boot Camp Assistant
- ColorSync Utility
- Console
- Digital Color Meter
- Disk Utility
- Grab
- Grapher
- Keychain Access
- Migration Assistant
- System Information
- Terminal
- VoiceOver Utility

## Languages

- Arabic
- Catalan
- Croatian
- Simplified Chinese
- Traditional Chinese
- Czech
- Danish
- Dutch
- English

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- Finnish
- French
- German
- Greek
- Hebrew
- Hungarian
- Indonesian
- Italian
- Japanese
- Korean
- Malay
- Norwegian
- Polish
- Brazilian Portuguese
- Portuguese
- Romanian
- Russian
- Slovak
- Spanish
- Spanish (Mexico)
- Swedish
- Thai
- Turkish
- Ukrainian
- Vietnamese

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\*The MacBook Pro (17-inch Late 2008) and the white MacBook (Late 2008) do not support AirDrop.

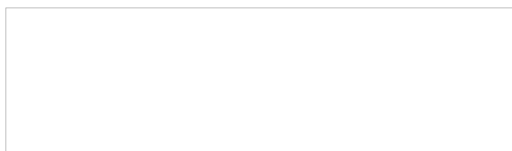
Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

iCloud requires iOS 5 or later on iPhone 3GS or later, iPod touch (3rd generation or later), iPad, or iPad mini; a Mac computer with OS X Lion v10.7.5 or later; or a PC with Windows 7 or Windows 8 (Outlook 2007 or later or an up-to-date browser is required for accessing email, contacts, and calendars). Some features require iOS 8 and OS X Yosemite or later. Some features require a Wi-Fi connection. Some features are not available in all countries. Access to some services is limited to 10 devices.

Published Date: Jan 28, 2016



# Magic Trackpad 2 - Technical Specifications



## Overview

Redesigned and rechargeable, Magic Trackpad 2 includes a built-in battery and brings Force Touch to the desktop for the first time. Four force sensors underneath the trackpad surface allow you to click anywhere, and detect subtle differences in the amount of pressure you apply, bringing increased functionality to your fingertips and enabling a deeper connection to your content. Magic Trackpad 2 also features an edge-to-edge glass surface area that is nearly 30 percent larger than the previous trackpad. This design, along with a lower profile, makes scrolling and swiping through your favorite content more productive and comfortable than ever.

Magic Trackpad 2 pairs automatically with your Mac, so you can get to work right away. And the battery will power your Magic Trackpad 2 for about a month or more before needing a recharge.

## What's in the Box

- Magic Trackpad 2
- Lightning to USB Cable

## Size and Weight

- Height: 0.19–0.43 inch (0.49–1.09 cm)
- Width: 6.3 inch (16.0 cm)
- Depth: 4.52 inches (11.49 cm)
- Weight: 0.51 pound (0.231 kg)\*

## General

- Force Touch
- Multi-Touch

## Connections and Expansion

- Bluetooth
- Lightning port
- Wireless

## System Requirements

- Bluetooth 4.0-enabled Mac computer with OS X v10.11 or later

---

\*Weight varies by configuration and manufacturing process.

Testing conducted by Apple in September 2015 using preproduction Magic Trackpad 2 devices, firmware and software with shipping iMac systems. Testing consisted of full battery discharge while engaging the device on a paired iMac using automated equipment. Battery life depends on device settings, usage and other factors.

Published Date: Oct 14, 2015

# Xserve - Technical Specifications

## Xserve - Technical Specifications

Configurations		
Order no.	M8627LL/A	M8628LL/A
Processor	1GHz PowerPC G4	Dual 1GHz PowerPC G4
On-chip L2 cache	256K at 1GHz	256K at 1GHz per processor
L3 cache (DDR SRAM)	2MB with 4GB/s throughput	2MB per processor with 4GB/s throughput
Memory (PC2100 DDR SDRAM)	256MB	512MB
Hard disk drive <sup>1</sup>	60GB (7200 rpm)	60GB (7200 rpm)
Optical drive	CD-ROM	CD-ROM
PCI slots	Two full-length 64-bit, 66MHz slots (one slot open) and one half-length 32-bit, 66MHz combination PCI/AGP slot	
Ethernet	One 10/100/1000BASE-T port onboard and one 10/100/1000BASE-T card in PCI/AGP slot	
Ports	Three FireWire, two USB, one DB-9, one VGA	
All models include rackmounting hardware; Mac OS X Server v10.1.5 with unlimited-client license (Mac OS X Server Install CD, WebObjects Deployment CD, Macintosh Manager 2 CD, NetBoot CD, Developer Tools CD, Admin Tools CD); Apple Hardware Test CD; complete setup, learning, and reference documentation; and one-year limited warranty.		

Product contains electronic documentation. Backup software is provided on CD-ROM.

Options	
System software	Mac OS X v10.1 <sup>6</sup>
Memory	512MB, 1GB, 1.5GB, 2GB
Internal storage	60GB Ultra ATA/100 Apple Drive Module (7200 rpm), 120GB Ultra ATA/100 Apple Drive Module (7200 rpm) <sup>1</sup>
Graphics	ATI Radeon 8500 AGP 4X graphics card (includes AGP riser)
Other	Ultra160 SCSI PCI card, Fiber Gigabit Ethernet PCI card

## Technical Specifications

## Storage

- Four internal bays with independent 100MHz buses for up to 480GB of internal storage<sup>1</sup> using hot-plug Apple Drive Modules, available in the following capacities:
  - 60GB 7200-rpm Ultra ATA/100 with 2MB disk cache
  - 120GB 7200-rpm Ultra ATA/100 with 2MB disk cache
- One bay filled with 60GB 7200-rpm Apple Drive Module (standard configurations)
- Support for reading SMART data from Apple Drive Modules for prefailure notification
- Tray-loading 24x-speed CD-ROM drive with front panel eject button
- Optional Ultra160 SCSI PCI card for connecting to external storage and backup devices

## Rack support

- Fits EIA-310-D8 compliant industry-standard 19-inch-wide racks, including:
  - Four-post racks from 29 to 36 inches deep
  - Two-post telco racks (center-mount brackets included)
- Mounting screws with M5 and 10/32-inch threads included
- Cable management arm for four-post racks included
- Front-to-back cooling for rack enclosures

## Electrical requirements

- Line voltage: Universal input (90V to 264V AC), power factor corrected
- Frequency: 47Hz to 63Hz, single phase
- Maximum input current: 3.6A
- Power usage:
  - Typical continuous power: 125W (single-processor system); 175W (dual processor system)
  - Maximum continuous power: 400W
- Agency-approved 12-foot power cable included

## Environmental requirements and approvals

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet
- FCC Class A approved

## Size and weight

- Height: 1.73 inches (4.4 cm)
- Width: 17.6 inches (44.7 cm) for mounting in standard 19-inch rack
- Depth: 28 inches (71.1 cm)
- Weight: 26 pounds (11.8 kg); 31 pounds (14.1 kg) with four Apple Drive Modules<sup>5</sup>

## Mac OS X Server

- Unlimited-Client License

## Included services

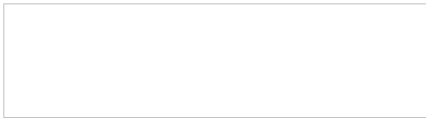
- File services: Macintosh (AFP over TCP/IP), Windows (SMB/CIFS), Internet (FTP), UNIX and Linux (NFS)
- Printer sharing: Macintosh and UNIX (LPR/LPD), Windows (SMB/CIFS)
- Internet and web: Apache web server, QuickTime Streaming Server, WebObjects deployment software, Mail (SMTP, POP, IMAP), WebDAV, SSL, PHP, MySQL, JavaServer Pages, Java Servlets, Perl, Mac CGI, caching web proxy
- Networking and security: BSD networking, SSH2, IP filtering firewall, DHCP server, DNS server, SLP server
- Workgroup management: Macintosh Manager 2, NetBoot
- Directory services: NetInfo, LDAP

## Remote monitoring and management tools

- Server Monitor for remote monitoring of key hardware subsystems: enclosure temperature, processor temperature, blower speed, hard drives (SMART data), Ethernet links, power supply and UPS systems, enclosure security
- Server Admin (TCP/IP)
- Remote Setup Assistant
- Simple Network Management Protocol (SNMP)
- InterMapper from Dartware
- Secure Shell (SSH2) for secure remote login
- Command-line tools for remote configuration and management, including installing software, running Software Update, and setting system and network preferences

1. For hard drive capacity measurements, 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less. Maximum capacity of 480GB achieved through use of four 120GB Apple Drive Modules.
2. A separate AppleCare Premium Service and Support Plan must be purchased for each Xserve system to be covered. To qualify, your Xserve system must be within its one-year hardware warranty. Coverage ends three years after date of Xserve purchase. Actual onsite response time and availability of onsite service depend on location; see [www.apple.com/support/products/premium](http://www.apple.com/support/products/premium) for details. Local telephone fees may apply; telephone numbers may vary and are subject to change.
3. Selected models.
4. Actual rates will vary.
5. Weight varies by configuration and manufacturing process.
6. Requires an attached display.

# Magic Mouse 2 - Technical Specifications



## Overview

Featuring a new design, Magic Mouse 2 is completely rechargeable, so you'll eliminate the use of traditional batteries. It's lighter, has fewer moving parts thanks to its built-in battery and continuous bottom shell, and has an optimized foot design — all helping Magic Mouse 2 track easier and move with less resistance across your desk. And the Multi-Touch surface allows you to perform simple gestures such as swiping between web pages and scrolling through documents. Magic Mouse 2 is ready to go right out of the box and pairs automatically with your Mac.

## What's in the Box

- Magic Mouse 2
- Lightning to USB Cable

## Size and Weight

- Height: 0.85 inch (2.16 cm)
- Width: 2.25 inches (5.71 cm)
- Depth: 4.47 inches (11.35 cm)
- Weight: 0.22 pound (0.099 kg)\*

## General

- Multi-Touch

## Connections and Expansion

- Bluetooth
- Lightning port
- Wireless

## System Requirements

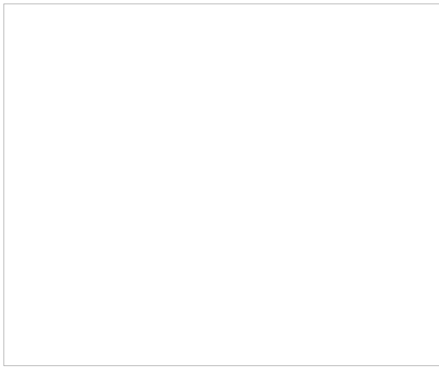
- Bluetooth-enabled Mac computer with OS X v10.11 or later

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\*Weight varies by configuration and manufacturing process.

Published Date: Nov 16, 2015

# iMac (Retina 5K, 27-inch, Late 2015) - Technical Specifications



## Display

- 27-inch (diagonal) Retina 5K display with IPS technology
- 5120-by-2880 resolution with support for millions of colors

## Processor

- **3.2GHz**  
3.2GHz quad-core Intel Core i5 (Turbo Boost up to 3.6GHz)
- **3.2GHz**  
3.2GHz quad-core Intel Core i5 (Turbo Boost up to 3.6GHz)  
*Configurable to 4.0GHz quad-core Intel Core i7 (Turbo Boost up to 4.2GHz)*
- **3.3GHz**  
3.3GHz quad-core Intel Core i5 (Turbo Boost up to 3.9GHz)  
*Configurable to 4.0GHz quad-core Intel Core i7 (Turbo Boost up to 4.2GHz)*

## Memory

- 8GB (two 4GB) of 1867MHz DDR3 memory; four SO-DIMM slots, user accessible  
*Configurable to 16GB or 32GB*

## Storage<sup>1</sup>

- **3.2GHz**  
1TB (7200-rpm) hard drive  
*Configurable up to 3TB Fusion Drive or 256GB or 512GB of flash storage (SSD)*
- **3.2GHz**  
1TB Fusion Drive  
*Configurable up to 3TB Fusion Drive or 256GB, 512GB, or 1TB of flash storage (SSD)*
- **3.3GHz**  
2TB Fusion Drive  
*Configurable up to 3TB Fusion Drive or 256GB, 512GB, or 1TB of flash storage (SSD)*

## Graphics

- **3.2GHz**  
AMD Radeon R9 M380 graphics processor with 2GB of GDDR5 memory
- **3.2GHz**  
AMD Radeon R9 M390 graphics processor with 2GB of GDDR5 memory
- **3.3GHz**  
AMD Radeon R9 M395 graphics processor with 2GB of GDDR5 memory  
*Configurable to AMD Radeon R9 M395X with 4GB of GDDR5 memory*

## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to two 4096-by-2160 external displays or one 5120-by-2880 dual-cable external display
- Support for extended desktop and video mirroring modes

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone

## Connections and Expansion



- 3.5 mm headphone jack
- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt 2 ports
  - Mini DisplayPort output
  - Support for HDMI, DVI, VGA, and dual-link DVI (adapters sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Kensington lock slot

## Input

### • Magic Keyboard

The redesigned Magic Keyboard comes standard with your iMac. It's wireless and rechargeable (so you won't be replacing batteries), with an ultracompact, edge-to-edge design that wastes no surface space. It has an improved scissor mechanism, optimized key travel, and a lower profile that increase control and comfort. And it pairs immediately with your iMac right out of the box.

### • Magic Mouse 2

The new design of Magic Mouse 2 lets it glide more smoothly across your desk. And since it supports Multi-Touch, you can use simple gestures on its surface to do things such as swipe between web pages and scroll through documents. So if you prefer to use a wireless mouse but want some of the benefits of Multi-Touch, Magic Mouse 2 is a great choice.

### • Magic Trackpad 2

If you prefer using a trackpad, Magic Trackpad 2 gives you the full range of Multi-Touch gestures and introduces Force Touch to the desktop. Sensors underneath the trackpad surface detect subtle differences in the amount of pressure you apply, bringing more functionality to your fingertips and enabling a deeper connection to your content. This new design, along with a lower profile, makes it even more comfortable to use.

## Wireless

### • Wi-Fi

802.11ac Wi-Fi wireless networking  
IEEE 802.11a/b/g/n compatible

### • Bluetooth

Bluetooth 4.0 wireless technology

## Size and Weight

### • 27-inch iMac

Height: 20.3 inches (51.6 cm)  
Width: 25.6 inches (65.0 cm)  
Stand depth: 8 inches (20.3 cm)  
Weight: 21 pounds (9.54 kg)<sup>2</sup>

### • 27-inch iMac with built-in VESA adapter

Height: 17.6 inches (44.7 cm)

# 731\_iMac (Retina 5K, 27-inch, Late 2015) - Technical Specifications.pdf

Width: 25.6 inches (65.0 cm)

Depth (including built-in VESA adapter): 3.1 inches (7.9 cm)

## Electrical and Operating Requirements

- Line voltage: 100–240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet

## Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 1-800-823-2775.

## In the Box

- iMac with Retina 5K display
- Magic Keyboard
- Magic Mouse 2
- Power cord
- Lightning to USB Cable

## Operating System

### macOS Sierra

macOS is the operating system that powers everything you do on a Mac. macOS Sierra introduces Siri to Mac<sup>3</sup> — along with new ways to enjoy your photos, shop more securely online, and work more seamlessly between devices.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iMac. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Safari
- Mail
- Messages
- FaceTime
- Calendar
- Notes
- App Store

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- iTunes
- iBooks
- Maps
- Contacts
- Reminders

## Configure to Order

Configure your iMac with these options. Looking for an iMac you can mount on a wall or an adjustable arm? [Choose an iMac with a Built-in VESA Mount Adapter.](#)

- **3.2GHz**
  - Magic Trackpad 2
  - 16GB or 32GB memory upgrade
  - 1TB, 2TB, or 3TB Fusion Drive
  - 256GB or 512GB of flash storage (SSD)
- **3.2GHz**
  - Magic Trackpad 2
  - 4.0GHz quad-core Intel Core i7 upgrade
  - 16GB or 32GB memory upgrade
  - 2TB or 3TB Fusion Drive
  - 256GB, 512GB, or 1TB of flash storage (SSD)
- **3.3GHz**
  - Magic Trackpad 2
  - 4.0GHz quad-core Intel Core i7 upgrade
  - 16GB or 32GB memory upgrade
  - AMD Radeon R9 M395X upgrade
  - 3TB Fusion Drive
  - 256GB, 512GB, or 1TB of flash storage (SSD)

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Beryllium-free
- Mercury-free LED-backlit display
- Recyclable aluminum enclosure
- Speaker enclosures made with 35 percent post-consumer recycled plastic
- Meets ENERGY STAR Version 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{W A,m}$ (B)	Sound Pressure Level Operator Position $L_{p A,m}$ (dB)
Idle	2.25 ( $K_v = 0.25$ )	15.5
Wireless web	2.25 ( $K_v = 0.25$ )	15.5
Hard drive seek	2.25 ( $K_v = 0.25$ )	15.5



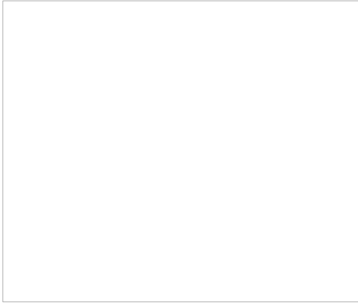
# 731\_iMac (Retina 5K, 27-inch, Late 2015) - Technical Specifications.pdf

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
  2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
  3. 1 B (bel) = 10 dB (decibel)
  4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
  5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
  6. The Wireless web test browses 25 popular websites.
  7. Configuration tested: 3.3GHz quad-core Intel Core i5 processor, 8GB memory, 2TB Fusion Drive, AMD Radeon R9 M395 graphics.
- 

1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
2. Weight varies by configuration and manufacturing process.
3. Siri may not be available in all languages or in all areas, and features may vary by area.
4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
5. PVC-free AC power cord available in all regions except India and South Korea.
6. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Nov 1, 2017

# iMac (Retina 4K, 21.5-inch, Late 2015) - Technical Specification



## Display

- 21.5-inch (diagonal) Retina 4K display with IPS technology
- 4096-by-2304 resolution with support for millions of colors

## Processor

- 3.1GHz quad-core Intel Core i5 (Turbo Boost up to 3.6GHz)  
*Configurable to 3.3GHz quad-core Intel Core i7 (Turbo Boost up to 3.8GHz)*

## Memory

- 8GB of 1867MHz LPDDR3 onboard memory  
*Configurable to 16GB*

## Storage<sup>1</sup>

- 1TB (5400-rpm) hard drive  
*Configurable up to 2TB Fusion Drive or 512GB of flash storage (SSD)*

## Graphics

- Intel Iris Pro Graphics 6200

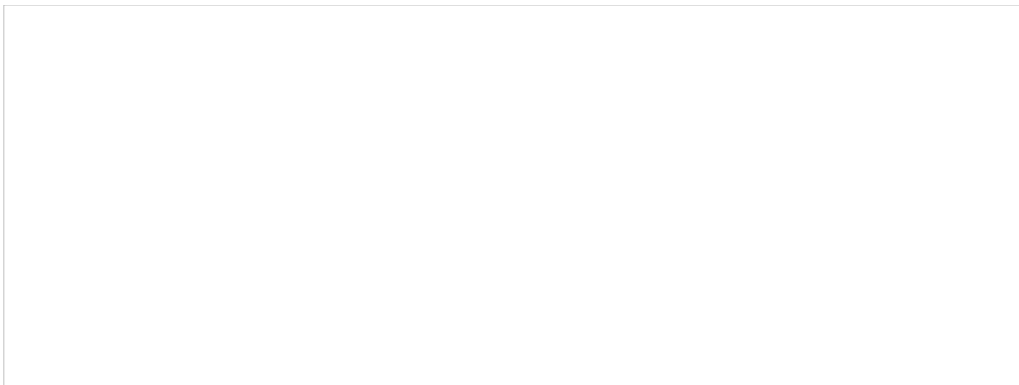
## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display and up to 4096 by 2304 pixels on an external display
- Support for extended desktop and video mirroring modes

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone

## Connections and Expansion



- 3.5 mm headphone jack
- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt 2 ports
  - Mini DisplayPort output
  - Support for HDMI, DVI, VGA, and dual-link DVI (adapters sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Kensington lock slot

## Input

- **Magic Keyboard**

The redesigned Magic Keyboard comes standard with your iMac. It's wireless and rechargeable (so you won't be replacing batteries), with an ultracompact, edge-to-edge design that wastes no surface space. It has an improved scissor mechanism, optimized key travel, and a lower profile that increase control and comfort. And it pairs immediately with your iMac right out of the box.

- **Magic Mouse 2**

The new design of Magic Mouse 2 lets it glide more smoothly across your desk. And since it supports Multi-Touch, you can use simple gestures on its surface to do things such as swipe between web pages and scroll through documents. So if you prefer to use a wireless mouse but want some of the benefits of Multi-Touch, Magic Mouse 2 is a great choice.

- **Magic Trackpad 2**

If you prefer using a trackpad, Magic Trackpad 2 gives you the full range of Multi-Touch gestures and introduces Force Touch to the desktop. Sensors underneath the trackpad surface detect subtle differences in the amount of pressure you apply, bringing more functionality to your fingertips and enabling a deeper connection to your content. This new design, along with a lower profile, makes it even more comfortable to use.

## Wireless

- **Wi-Fi**

802.11ac Wi-Fi wireless networking  
IEEE 802.11a/b/g/n compatible

- **Bluetooth**

Bluetooth 4.0 wireless technology

## Size and Weight

- **21.5-inch iMac**

Height: 17.7 inches (45.0 cm)  
Width: 20.8 inches (52.8 cm)  
Stand depth: 6.9 inches (17.5 cm)  
Weight: 12.5 pounds (5.68 kg)<sup>2</sup>

- **21.5-inch iMac with built-in VESA adapter**

Height: 15.7 inches (37.9 cm)  
Width: 20.8 inches (52.8 cm)  
Depth (including built-in VESA adapter): 2.6 inches (6.6 cm)

## Electrical and Operating Requirements

- Line voltage: 100–240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet

# 732\_iMac (Retina 4K, 21.5-inch, Late 2015) - Technical Specification.pdf

## Limited Warranty and Service

Your iMac comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer's purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 1-800-823-2775.

## In the Box

- 21.5-inch iMac with Retina 4K display
- Magic Keyboard
- Magic Mouse 2
- Power cord
- Lightning to USB Cable

## Operating System

### macOS Sierra

macOS is the operating system that powers everything you do on a Mac. macOS Sierra introduces Siri to Mac<sup>3</sup> — along with new ways to enjoy your photos, shop more securely online, and work more seamlessly between devices.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iMac. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Safari
- Mail
- Messages
- FaceTime
- Calendar
- Notes
- App Store
- iTunes
- iBooks
- Maps
- Contacts
- Reminders

## Configure to Order

Configure your iMac with these options, only at the [Apple Online Store](#).

Looking for an iMac you can mount on a wall or an adjustable arm? [Choose an iMac with a Built-in VESA Mount Adapter](#).

# 732\_iMac (Retina 4K, 21.5-inch, Late 2015) - Technical Specification.pdf

- Magic Trackpad 2
- 3.3GHz quad-core Intel Core i7 upgrade
- 16GB memory upgrade
- 1TB or 2TB Fusion Drive
- 256GB or 512GB of flash storage (SSD)

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Beryllium-free
- Mercury-free LED-backlit display
- Recyclable aluminum enclosure
- Speaker enclosures made with 35 percent post-consumer recycled plastic
- Fan assembly made with 28 percent bio-based plastic
- Meets ENERGY STAR Version 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

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## Acoustic Performance

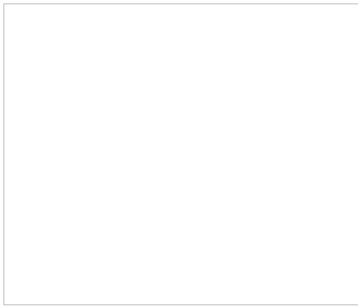
Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.95 ( $K_v = 0.25$ )	11.0
Wireless web	1.95 ( $K_v = 0.25$ )	11.0
Hard drive seek	2.00 ( $K_v = 0.25$ )	11.5

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
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4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 3.1GHz quad-core Intel Core i5 processor, 8GB memory, 1TB hard drive, Intel Iris Pro Graphics 6200.

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Siri may not be available in all languages or in all areas, and features may vary by area.
  4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  5. PVC-free AC power cord available in all regions except India and South Korea.
  6. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

# iMac (21.5-inch, Late 2015) - Technical Specification



## Display

- 21.5-inch (diagonal) LED-backlit display with IPS technology
- 1920-by-1080 resolution with support for millions of colors

## Processor

- **1.6GHz**  
1.6GHz dual-core Intel Core i5 (Turbo Boost up to 2.7GHz)
- **2.8GHz**  
2.8GHz quad-core Intel Core i5 (Turbo Boost up to 3.3GHz)

## Memory

- 8GB of 1867MHz LPDDR3 onboard memory  
*Configurable to 16GB*

## Storage<sup>1</sup>

- **1.6GHz**  
1TB (5400-rpm) hard drive  
*Configurable up to 1TB Fusion Drive or 256GB of flash storage (SSD)*
- **2.8GHz**  
1TB (5400-rpm) hard drive  
*Configurable up to 2TB Fusion Drive or 256GB of flash storage (SSD)*

## Graphics

- **1.6GHz**  
Intel HD Graphics 6000
- **2.8GHz**  
Intel Iris Pro Graphics 6200

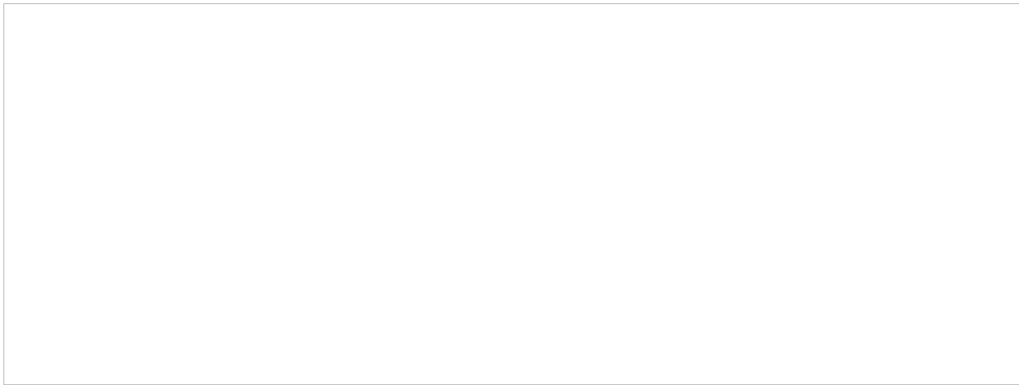
## Video Support and Camera

- **1.6GHz**
  - FaceTime HD camera
  - Simultaneously supports full native resolution on the built-in display and up to 3840 by 2160 pixels on an external display
  - Support for extended desktop and video mirroring modes
- **2.8GHz**
  - FaceTime HD camera
  - Simultaneously supports full native resolution on the built-in display and up to 4096 by 2304 pixels on an external display
  - Support for extended desktop and video mirroring modes

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack
  - Headphone/optical digital audio output (minijack)
  - Support for Apple iPhone headset with microphone

## Connections and Expansion



- 3.5 mm headphone jack
- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt 2 ports
  - Mini DisplayPort output
  - Support for HDMI, DVI, VGA, and dual-link DVI (adapters sold separately)
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- Kensington lock slot

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## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking  
IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Size and Weight

- **21.5-inch iMac**  
Height: 17.7 inches (45.0 cm)  
Width: 20.8 inches (52.8 cm)  
Stand depth: 6.9 inches (17.5 cm)  
Weight: 12.5 pounds (5.68 kg)<sup>2</sup>
- **21.5-inch iMac with built-in VESA adapter**  
Height: 15.7 inches (39.9 cm)  
Width: 20.8 inches (52.8 cm)  
Depth (including built-in VESA adapter): 2.6 inches (6.6 cm)

## Electrical and Operating Requirements

- Line voltage: 100–240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)

# 733\_iMac (21.5-inch, Late 2015) - Technical Specification.pdf

- Relative humidity: 5% to 95% noncondensing
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## In the Box

- 21.5-inch iMac
- Magic Keyboard
- Magic Mouse 2
- Power cord
- Lightning to USB Cable

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### macOS Sierra

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Features include:

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- Reduce Motion
- Siri and Dictation
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- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Safari
- Mail
- Messages
- FaceTime
- Calendar
- Notes
- App Store
- iTunes
- iBooks
- Maps
- Contacts
- Reminders

## Configure to Order



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- **1.6GHz**
  - Magic Trackpad 2
  - 16GB memory upgrade
  - 1 TB Fusion Drive
  - 256GB of flash storage (SSD)
- **2.8GHz**
  - Magic Trackpad 2
  - 16GB memory upgrade
  - 1 TB or 2TB Fusion Drive
  - 256GB of flash storage (SSD)

## iMac and the Environment

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Hard drive seek	2.00 ( $K_v = 0.25$ )	12.0

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5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 1.6GHz dual-core Intel Core i5 processor, 8GB memory, 1TB hard drive, Intel HD Graphics 6000.

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
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# 733\_iMac (21.5-inch, Late 2015) - Technical Specification.pdf

5. PVC-free AC power cord available in all regions except India and South Korea.
6. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Sep 25, 2017

# Magic Keyboard - Technical Specifications



## Overview

The Magic Keyboard combines a sleek new design with a built-in rechargeable battery and enhanced key features. With an improved scissor mechanism beneath each key for increased stability, as well as optimized key travel and a lower profile, the Magic Keyboard provides a remarkably comfortable and precise typing experience. It pairs automatically with your Mac, so you can get to work right away. And the battery is incredibly long-lasting — it will power your keyboard for about a month or more between charges.

## What's in the Box

- Magic Keyboard
- Lightning to USB Cable

## Size and Weight

- Height: 0.16–0.43 inch (0.41–1.09 cm)
- Width: 10.98 inches (27.9 cm)
- Depth: 4.52 inches (11.49 cm)
- Weight: 0.51 pound (0.231 kg)\*

## General

- Multimedia keys

## Connections and Expansion

- Bluetooth
- Lightning port
- Wireless

## System Requirements

- Bluetooth-enabled Mac computer with OS X v10.11 or later
- iOS devices running iOS 9.1 or later

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\*Weight varies by configuration and manufacturing process.

Testing conducted by Apple in September 2015 using preproduction Magic Keyboard devices, firmware and software with shipping iMac systems. Testing consisted of full battery discharge while engaging the device on a paired iMac using automated equipment. Battery life depends on device settings, usage and other factors.

Published Date: May 10, 2016

# Apple Watch (1st generation) - Technical Specifications

## Apple Watch

### 38mm (A1553)



Stainless Steel

Space Black Stainless Steel

**Height:** 38.6mm - **Width:** 33.3mm - **Depth:** 10.5mm - **Case:** 40g

### 42mm (A1554)



Stainless Steel

Space Black Stainless Steel

**Height:** 42.0mm - **Width:** 35.9mm - **Depth:** 10.5mm - **Case:** 50g

## Apple Watch features

- Stainless steel or space black stainless steel case
- Sapphire crystal
- Retina display with Force Touch
- Ceramic back
- Digital Crown
- Heart rate sensor, accelerometer, and gyroscope
- Ambient light sensor
- Speaker and microphone
- Wi-Fi (802.11b/g/n 2.4GHz)
- Bluetooth 4.0
- Up to 18 hours of battery life<sup>1</sup>
- Water resistant<sup>2</sup>
- watchOS 2

## What's in the box

- Apple Watch
- Magnetic charging cable (2 m)
- USB power adapter (5W)
- Band (Sport Band includes band that can be configured for either S/M or M/L length)
- Quick start guide

## Language

- **Language Support**  
English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish,

# 735\_Apple Watch (1st generation) - Technical Specifications.pdf

Ukrainian, Vietnamese

- **Dictation languages**

English (Australia, Canada, India, Ireland, New Zealand, Philippines, Singapore, South Africa, UK, U.S.), Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish (Denmark), Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew (Israel), Hungarian, Indonesian, Malaysian, Norwegian (Norway), Polish, Portuguese (Brazil, Portugal), Romanian, Russian (Russia), Slovakian, Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Ukrainian, Vietnamese

- **Siri languages**

English (Australia, Canada, India, New Zealand, Singapore, UK, U.S.), Spanish (Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Russian (Russia), Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)

- 
1. Battery life varies by use and configuration; actual results will vary. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/watch/battery.html](http://www.apple.com/watch/battery.html) for more information.
  2. Apple Watch is splash and water resistant but not waterproof. You can, for example, wear and use Apple Watch during exercise, in the rain, and while washing your hands, but submerging Apple Watch is not recommended. Apple Watch has a water resistance rating of IPX7 under IEC standard 60529. The leather bands are not water resistant.

Features are subject to change and may not be available in all regions or all languages. Requires iPhone 5 or later.

To learn more about wearing Apple Watch, getting a good fit, potential skin sensitivity, and proper care and cleaning, click [here](#).

Published Date: Oct 5, 2016

# Apple Watch Sport (1st generation) - Technical Specifications

## Apple Watch Sport

### 38mm (A1553)



Silver Aluminum

Space Gray Aluminum



Rose Gold Aluminum

Gold Aluminum

**Height:** 38.6mm - **Width:** 33.3mm - **Depth:** 10.5mm - **Case:** 25g

### 42mm (A1554)



Silver Aluminum

Space Gray Aluminum



Rose Gold Aluminum

Gold Aluminum

**Height:** 42.0mm - **Width:** 35.9mm - **Depth:** 10.5mm - **Case:** 30g

## Apple Watch Sport features

- Silver, space gray, gold, or rose gold anodized aluminum case
- Ion-X glass
- Retina display with Force Touch
- Composite back
- Digital Crown
- Heart rate sensor, accelerometer, and gyroscope
- Ambient light sensor
- Speaker and microphone

# 736\_Apple Watch Sport (1st generation) - Technical Specifications.pdf

- Wi-Fi (802.11b/g/n 2.4GHz)
- Bluetooth 4.0
- Up to 18 hours of battery life<sup>1</sup>
- Water resistant<sup>2</sup>
- watchOS 2

## What's in the box

- Apple Watch
- Magnetic charging cable (2 m)
- USB power adapter (5W)
- Band (Sport Band includes band that can be configured for either S/M or M/L length)
- Quick start guide

## Language

### • Language Support

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • Dictation languages

English (Australia, Canada, India, Ireland, New Zealand, Philippines, Singapore, South Africa, UK, U.S.), Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish (Denmark), Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew (Israel), Hungarian, Indonesian, Malaysian, Norwegian (Norway), Polish, Portuguese (Brazil, Portugal), Romanian, Russian (Russia), Slovakian, Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Ukrainian, Vietnamese

### • Siri languages

English (Australia, Canada, India, New Zealand, Singapore, UK, U.S.), Spanish (Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Russian (Russia), Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)

- 
1. Battery life varies by use and configuration; actual results will vary. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/watch/battery.html](http://www.apple.com/watch/battery.html) for more information.
  2. Apple Watch is splash and water resistant but not waterproof. You can, for example, wear and use Apple Watch during exercise, in the rain, and while washing your hands, but submerging Apple Watch is not recommended. Apple Watch has a water resistance rating of IPX7 under IEC standard 60529. The leather bands are not water resistant.

Features are subject to change and may not be available in all regions or all languages. Requires iPhone 5 or later.

To learn more about wearing Apple Watch, getting a good fit, potential skin sensitivity, and proper care and cleaning, click [here](#).

Published Date: Oct 5, 2016

# Apple Watch Edition (1st generation) - Technical Specifications

## Apple Watch Edition

### 38mm (A1553)



18-Karat Rose Gold, white cap

18-Karat Rose Gold, black cap



18-Karat Yellow Gold, red cap

18-Karat Yellow Gold, black cap

**Height:** 38.6mm - **Width:** 33.3mm - **Depth:** 10.5mm - **Case (yellow gold):** 55g - **Case (rose gold):** 54g

### 42mm (A1554)



18-Karat Rose Gold, white cap

18-Karat Rose Gold, blue cap



18-Karat Yellow Gold, black cap

18-Karat Yellow Gold, blue cap

**Height:** 42.0mm - **Width:** 35.9mm - **Depth:** 10.5mm - **Case (yellow gold):** 69g - **Case (rose gold):** 67g

## Apple Watch Edition features

- 18-karat yellow or rose gold case
- Sapphire crystal
- Retina display with Force Touch
- Ceramic back
- Digital Crown
- Heart rate sensor, accelerometer, and gyroscope
- Ambient light sensor
- Speaker and microphone



# 737\_Apple Watch Edition (1st generation) - Technical Specifications.pdf

- Wi-Fi (802.11b/g/n 2.4GHz)
- Bluetooth 4.0
- Up to 18 hours of battery life<sup>1</sup>
- Water resistant<sup>2</sup>
- watchOS 2

## What's in the box

- Apple Watch
- Magnetic charging case
- Magnetic charging cable (2 m)
- Lightning to USB cable
- USB power adapter (5W)
- Band (Sport Band includes band that can be configured for either S/M or M/L length)
- Quick start guide

## Language

### • Language Support

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • Dictation languages

English (Australia, Canada, India, Ireland, New Zealand, Philippines, Singapore, South Africa, UK, U.S.), Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish (Denmark), Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew (Israel), Hungarian, Indonesian, Malaysian, Norwegian (Norway), Polish, Portuguese (Brazil, Portugal), Romanian, Russian (Russia), Slovakian, Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Ukrainian, Vietnamese

### • Siri languages

English (Australia, Canada, India, New Zealand, Singapore, UK, U.S.), Spanish (Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Russian (Russia), Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)

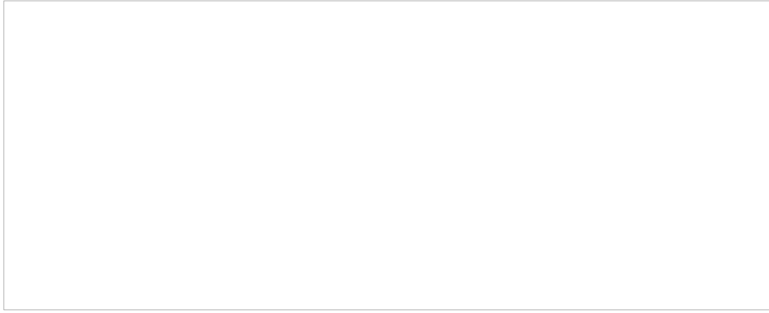
- 
1. Battery life varies by use and configuration; actual results will vary. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/watch/battery.html](http://www.apple.com/watch/battery.html) for more information.
  2. Apple Watch is splash and water resistant but not waterproof. You can, for example, wear and use Apple Watch during exercise, in the rain, and while washing your hands, but submerging Apple Watch is not recommended. Apple Watch has a water resistance rating of IPX7 under IEC standard 60529. The leather bands are not water resistant.

Features are subject to change and may not be available in all regions or all languages. Requires iPhone 5 or later.

To learn more about wearing Apple Watch, getting a good fit, potential skin sensitivity, and proper care and cleaning, click [here](#).

Published Date: Oct 5, 2016

# iPhone SE - Technical Specifications



## Finish

- Silver
- Gold
- Space Gray
- Rose Gold

## Capacity<sup>1</sup>

- 16GB
- 32GB
- 64GB
- 128GB

## Size and Weight<sup>2</sup>

- Height: 4.87 inches (123.8 mm)
- Width: 2.31 inches (58.6 mm)
- Depth: 0.30 inch (7.6 mm)
- Weight: 3.99 ounces (113 grams)

## Display

- Retina display
- 4-inch (diagonal) widescreen LCD Multi-Touch display with IPS technology
- 1136-by-640-pixel resolution at 326 ppi
- 800:1 contrast ratio (typical)
- Full sRGB standard
- 500 cd/m<sup>2</sup> max brightness (typical)
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously

## Chip

- A9 chip with 64-bit architecture
- Embedded M9 motion coprocessor

## Camera

- 12-megapixel camera
- *f*/2.2 aperture
- Five-element lens
- 5x digital zoom
- Live Photos with stabilization
- Local tone mapping
- Face detection
- True Tone flash
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels

# 738\_iPhone SE - Technical Specifications.pdf

- Tap to focus with Focus Pixels
- Exposure control
- Noise reduction
- Auto HDR for photos
- Panorama (up to 63 megapixels)
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging

## Video Recording

- 4K video recording at 30 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- 3x digital zoom
- True Tone flash
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Face detection
- Noise reduction
- Slo-mo video support for 1080p at 120 fps and 720p at 240 fps
- Time-lapse video with stabilization
- Take 8-megapixel still photos while recording 4K video
- Playback zoom
- Video geotagging

## FaceTime HD Camera

- 1.2-megapixel photos
- *f*/2.4 aperture
- Retina Flash
- 720p HD video recording
- Auto HDR for photos
- Backside illumination sensor
- Face detection
- Burst mode
- Exposure control
- Timer mode

## Touch ID

- Fingerprint sensor built into the Home button

## Apple Pay

- Pay with your iPhone using Touch ID in stores, within apps, and on the web
- Complete purchases made with Apple Pay on your Mac
- Receive and redeem rewards using rewards cards

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1662\***
  - LTE (Bands 1, 2, 3, 4, 5, 8, 12, 13, 17, 18, 19, 20, 25, 26, 29)
  - CDMA EV-DO Rev. A (800, 1700/2100, 1900, 2100 MHz)
  - UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)
  - GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1723\***
  - LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 17, 18, 19, 20, 25, 26, 28)
  - TD-LTE (Bands 38, 39, 40, 41)
  - TD-SCDMA 1900 (F), 2000 (A)
  - CDMA EV-DO Rev. A (800, 1700/2100, 1900, 2100 MHz)
  - UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)

# 738\_iPhone SE - Technical Specifications.pdf

- GSM/EDGE (850, 900, 1800, 1900 MHz)
- **All models**
  - 802.11ac Wi-Fi
  - Bluetooth 4.2 wireless technology
  - NFC

## Location

- Assisted GPS and GLONASS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>3</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>3</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>4</sup>
- Wi-Fi calling<sup>4</sup>

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Siri<sup>5</sup>

- Use your voice to send messages, set reminders, and more
- Get intelligent suggestions in Messages, Mail, QuickType, and more
- Activate with only your voice using “Hey Siri”
- Listen and identify songs

[Learn more about Siri](#)

## External Buttons and Connectors

- Touch ID sensor
- Volume up/down
- Ring/Silent
- On/Off - Sleep/Wake
- 3.5 mm headphone jack
- Lightning connector
- Microphone
- Built-in speaker

## Power and Battery<sup>6</sup>

# 738\_iPhone SE - Technical Specifications.pdf

- **Talk time:**  
Up to 14 hours on 3G
- **Internet use:**  
Up to 12 hours on 3G,  
up to 13 hours on LTE,  
up to 13 hours on Wi-Fi
- **Video playback:**  
Up to 13 hours
- **Audio playback:**  
Up to 50 hours
- **Standby time:**  
Up to 10 days

Built-in rechargeable lithium-ion battery

Charging via USB to computer system or power adapter

## Sensors

- Touch ID fingerprint sensor
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 11

With new features and capabilities that let you get more done quickly and easily, iOS 11 makes iPhone more powerful, personal, and intelligent than ever.

[See what's new in iOS 11](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPhone SE. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can fully enjoy the world's most personal device. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Software TTY
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store

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- Notes
- News
- Contacts
- iBooks
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Files
- Find My iPhone
- Find My Friends
- Settings

## Free Apps from Apple<sup>7</sup>

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.*

- iMovie
- Pages
- Numbers
- Keynote
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips

## Headphones

- EarPods with 3.5 mm Headphone Plug
- Storage and travel case

## SIM Card

- Nano-SIM  
*iPhone SE is not compatible with existing micro-SIM cards.*

## Rating for Hearing Aids

- Model A1662, A1723: M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>8</sup>

Syncing with iTunes on a Mac or PC requires:

# 738\_iPhone SE - Technical Specifications.pdf

- Mac: OS X 10.9.5 or later
- PC: Windows 7 or later
- iTunes 12.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

### • **Language support**

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • **QuickType keyboard support**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

### • **QuickType keyboard support with predictive input**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

### • **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

### • **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

### • **Bilingual dictionary support**

Chinese (Simplified), Dutch, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish

### • **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPhone with iOS 11
- EarPods with 3.5 mm Headphone Plug
- Lightning to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

# 738\_iPhone SE - Technical Specifications.pdf

iPhone SE embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Recyclable aluminum enclosure

## Apple and the Environment

Apple is dedicated to reducing the environmental impact of our products and process. [Learn more](#). Or read our detailed information on the environmental performance of every Apple product. Read our [Product Environmental Reports](#).

## Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

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\* To identify your iPhone model number, see <https://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

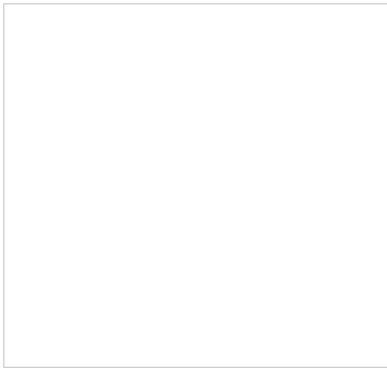
1. Available space is less and varies due to many factors. A standard configuration uses approximately 8GB to 11GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
2. Size and weight vary by configuration and manufacturing process.
3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
4. Data plan required. LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
5. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
6. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
7. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the App Store. Downloading apps requires an Apple ID and a device that is compatible with the iOS version required for each app.
8. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Published Date: Apr 23, 2018



# iPad Pro (9.7-inch) - Technical Specifications



## Finish

- Silver
- Gold
- Space Gray
- Rose Gold

## Capacity<sup>1</sup>

- **Wi-Fi models**
  - 32GB
  - 128GB
  - 256GB
- **Wi-Fi + Cellular models**
  - 32GB
  - 128GB
  - 256GB

## Size and Weight<sup>2</sup>

- **Wi-Fi models**
  - Height: 9.4 inches (240 mm)
  - Width: 6.6 inches (169.5 mm)
  - Depth: 0.24 inch (6.1 mm)
  - Weight: 0.96 pound (437 grams)
- **Wi-Fi + Cellular models**
  - Height: 9.4 inches (240 mm)
  - Width: 6.6 inches (169.5 mm)
  - Depth: 0.24 inch (6.1 mm)
  - Weight: 0.98 pound (444 grams)

## Buttons and Connectors

- Built-in stereo speakers
- Lightning connector
- Home/Touch ID sensor
- Smart Connector
- 3.5 mm headphone jack
- Built-in stereo speakers
- On/Off - Sleep/Wake
- Dual microphones
- Volume up/down
- Nano-SIM tray

## In the Box

- iPad Pro
- Lightning to USB Cable
- USB Power Adapter

# 739\_iPad Pro (9.7-inch) - Technical Specifications.pdf

## Display

- Retina display
- 9.7-inch (diagonal) LED-backlit Multi-Touch display
- 2048-by-1536 resolution at 264 pixels per inch (ppi)
- Wide color display (P3)
- True Tone display
- Fingerprint-resistant oleophobic coating
- Fully laminated display
- Antireflective coating

## Chip

- A9X chip with 64-bit architecture
- Embedded M9 coprocessor

## Camera

- 12-megapixel camera
- Live Photos
- Autofocus with Focus Pixels
- True Tone flash
- Wide color photo capture
- Panorama (up to 63 megapixels)
- Auto HDR for photos
- Exposure control
- Burst mode
- Timer mode
- $f/2.2$  aperture
- Five-element lens
- Hybrid IR filter
- Backside illumination
- Sapphire crystal lens cover
- Auto image stabilization
- Improved local tone mapping
- Improved noise reduction
- Face detection
- Photo geotagging

## Video Recording

- 4K video recording (3840 by 2160) at 30 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Slo-mo video support for 1080p at 120 fps and 720p at 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization
- 3x video zoom
- Face detection
- Video geotagging

## FaceTime HD Camera

- 5-megapixel photos
- Live Photos
- 720p HD video recording
- Retina Flash
- $f/2.2$  aperture
- Auto HDR for photos and videos
- Backside illumination
- Exposure control
- Burst mode
- Timer mode
- Face detection

## FaceTime Calling<sup>3</sup>

- FaceTime audio to any FaceTime-enabled device over Wi-Fi or cellular
- FaceTime video to any FaceTime-enabled device over Wi-Fi or cellular

## Speakers

- Four speaker audio

## Microphones

- Dual microphones for calls, video recording, and audio recording

## Cellular and Wireless

- **All models**  
Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO  
Bluetooth 4.2 technology
- **9.7-inch iPad Pro Wi-Fi + Cellular models**  
UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)  
CDMA EV-DO Rev. A and Rev. B (800, 1900 MHz)  
LTE Advanced (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30, 38, 39, 40, 41)<sup>4</sup>  
Data only<sup>5</sup>  
Wi-Fi calling<sup>4</sup>  
Embedded Apple SIM<sup>6</sup>  
[Learn more about Apple SIM](#)

## SIM Card

- Nano-SIM (supports Apple SIM)

## Location

- **All models**
  - Digital compass
  - Wi-Fi
  - iBeacon microlocation
- **Wi-Fi + Cellular models**
  - Assisted GPS and GLONASS
  - Cellular

## Sensors

- Touch ID
- Three-axis gyro
- Accelerometer
- Barometer
- Ambient light sensor

## Touch ID

- Unlock iPad
- Secure personal data within apps
- Make purchases from the iTunes Store, App Store, and iBooks Store

## Apple Pay

- Pay with your iPad using Touch ID within apps and on the web

[Learn more about Apple Pay](#)

## Siri<sup>7</sup>

- Use your voice to send messages, set reminders, and more

# 739\_iPad Pro (9.7-inch) - Technical Specifications.pdf

- Get proactive suggestions
- Use your iPad hands-free
- Listen and identify songs

[Learn more about Siri](#)

## Power and Battery<sup>8</sup>

- **9.7-inch iPad Pro**
  - Built-in 27.5-watt-hour rechargeable lithium-polymer battery
- **All models**
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- **Wi-Fi + Cellular models**
  - Up to 9 hours of surfing the web using cellular data network

## Operating System

### iOS 10

With an all-new design and all-new features, iOS 10 is the world's most advanced mobile OS. It brings your iPad to life in more intelligent and expressive ways than ever. [See what's new in iOS 10](#)

iOS 10 includes:

- AirDrop
- AirPlay
- AirPrint
- Control Center
- Notification Center
- Siri
- Spotlight Search
- Apple Music
- Family Sharing
- iCloud Drive
- Multitasking
- QuickType Keyboard
- Night Shift

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPad Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Siri and Dictation
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

*Built-in apps are an essential part of your iPad experience and are efficiently designed to use less than 200MB of storage.*

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps

# 739\_iPad Pro (9.7-inch) - Technical Specifications.pdf

- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- Contacts
- iBooks
- Home
- Reminders
- Clock
- TV
- Photo Booth
- Podcasts
- News
- Find My iPhone
- Find My Friends
- iCloud Drive

## Free Apps from Apple<sup>9</sup>

*Pages, Numbers, Keynote, iMovie, GarageBand, and iTunes U are preinstalled on iPad.*

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Apple Store
- Trailers
- iTunes Remote
- Music Memos
- Clips

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>10</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X 10.9.5 or later
- PC: Windows 7 or later
- iTunes 12.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Languages

- **Language support**  
English (Australia, Canada, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **QuickType keyboard support**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Latvian, Lithuanian, Macedonian, Malay, Marathi, Norwegian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Turkish, Ukrainian, Urdu, Vietnamese
- **QuickType keyboard support with predictive input<sup>11</sup>**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

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- **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Russian (Russia), Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)

- **Dictation languages**

English (Australia, Canada, India, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, UAE, UK, U.S.), Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Kuwait, Saudi Arabia, Qatar, UAE), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovakian, Swedish, Turkish, Thai, Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese (Brazil), Russian, Spanish, Swedish, Thai, Turkish

- **Bilingual dictionary support**

Chinese (Simplified), Dutch, French, German, Italian, Japanese, Korean, Spanish

- **Spell check**

English (Australia, Canada, UK, U.S.), French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese (Brazil, Portugal), Russian, Swedish, Turkish

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- **Viewable document types**

.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

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iPad Pro may ship with iOS 9. iOS 10 will be available as a free download beginning September 13.

1. Available space is less and varies due to many factors. A standard configuration uses approximately 4GB to 6GB of space (including iOS and built-in apps) depending on the model and settings.
2. Size and weight vary by configuration and manufacturing process.
3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
4. Data plan required. LTE Advanced, LTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).

## 739\_iPad Pro (9.7-inch) - Technical Specifications.pdf

5. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
6. Embedded Apple SIM in iPad Pro (9.7-inch) may be disabled when purchased from some carriers. See your carrier for details. Apple SIM and embedded Apple SIM not available in China.
7. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
8. Testing conducted by Apple in March 2016 using preproduction iPad Pro (9.7-inch) units and software and in August 2015 using preproduction iPad Pro (12.9-inch) units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.
9. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the App Store. Downloading apps requires an Apple ID and a device that is compatible with the iOS version required for each app.
10. Wireless broadband recommended; fees may apply.
11. Customized suggestions based on recipient and app are not available for Chinese (Simplified, Traditional), Japanese, Korean, and Thai.

Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: Jul 10, 2017

# iPod with Click Wheel (20 GB, 40 GB including U2 Special Edition) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iPod with Click Wheel (20 GB, 40 GB including U2 Special Edition) - Technical Specifications

Configurations (Mac + PC)	20GB iPod	40GB iPod
Model	M9282LL/A M9787LL/A (U2 Special Edition iPod) introduced Oct. 26, 2004	M9268LL/A
Storage	20GB(1)	40GB(1)
Battery life	Up to 12 hours(3)	
Skip protection	Up to 25 minutes	
Display	2-inch (diagonal) grayscale LCD with LED backlight	
Ports	Dock connector, remote connector, stereo minijack	
Connectivity	FireWire 400 and USB 2.0 through dock connector	
Charge time	About 4 hours (2-hour fast charge to 80% capacity)	
Audio support	AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible, AIFF, Apple Lossless and WAV	
Size	4.1 by 2.4 by 0.57 inches	4.1 by 2.4 by 0.69 inches
Weight	5.6 ounces	6.2 ounces
Included software	iTunes for Mac, iTunes for Windows(4)	
Included accessories	Earbud headphones, AC adapter, FireWire cable, USB 2.0 cable	Earbud headphones, dock, AC adapter, FireWire cable, USB 2.0 cable
Optional accessories	Dock; armband (iPod mini only); in-ear headphones; earbud headphones and remote; carrying case; AC adapter; USB 2.0 cable; FireWire cable; world travel adapter kit	
Mac requirements	Macintosh computer with FireWire port; Mac OS X v10.1.5 or later (Mac OS X 10.3 or later recommended); USB 2.0 requires Mac OS X v10.3.4	
Windows requirements	PC with FireWire or USB 2.0 port, or FireWire or USB 2.0 card; Windows 2000 with Service Pack 4 or Windows XP Home or Professional	
Documentation and support	Electronic documentation and getting started guide.	
Limited warranty and service	Your iPod comes with single incident telephone support for the first 90 days and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> for iPod to extend your service and support to two full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	

Options & Accessories	Available from the online <a href="#">Apple Store</a> or an authorized Apple reseller.	
Cables and adapters	FireWire Cable M9127G/A iPod Stereo Connection Kit M9339LL/C	
Docks	iPod Dock M9602G/A	
Headphones	Remote & Earbud Headphones M9128G/A In-Ear Headphones M9394G/A	
Cases	Carrying Case w/ Belt Clip M9603G/A (20GB)    M9129G/A (40GB)	
Services	AppleCare Protection Plan M9404LL/A	

### Technical Specifications



# 73 iPod with Click Wheel (20 GB, 40 GB including U2 Special Edition) - Technical Specification

## Capacity

- 20 GB or 40 GB hard disk drive<sup>(1)</sup>
  - Holds 5,000 or 10,000 songs in 128-Kbps AAC format<sup>(2)</sup>
  - Stores data via FireWire or USB 2.0<sup>(3)</sup> hard drive

## Size and weight (20GB model and U2 Special Edition model)

- Height: 4.1 in
- Width: 2.4 in
- Depth: 0.57 in
- Weight: 5.6 oz (158 g)

## Size and weight (40GB model)

- Height: 4.1 in
- Width: 2.4 in
- Depth: 0.69 in
- Weight: 6.2 oz (176 g)

## Display (20 GB and 40 GB model)

- 2-inch (diagonal) liquid crystal display with blue-white LED backlight
- 160-by-128-pixel resolution, 0.24-mm dot pitch
- Support for display of multiple languages and characters simultaneously

## Audio

- Up to 25 minutes of skip protection
- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible, AIFF, Apple Lossless and WAV
- Upgradable firmware enables support for future audio formats

## Customizable settings (iPod)

- Customize main menu
- Create multiple On-The-Go playlists
- Adjust audiobook playback speed
- Clicker playback through headphones
- Rate songs
- Shuffle songs or albums
- Repeat one or all
- Sound Check on or off
- 20 Equalizer settings
- Backlight timer
- Display contrast
- Alarms on, off or silent
- Sleep timer
- Date and time
- Display time in menu bar
- Contacts sort and display by first or last names
- Clicker on or off
- Menu Languages: English, French, German, Japanese, Spanish, Italian, Dutch, Danish, Norwegian, Finnish, Swedish, Korean, Simplified Chinese, Traditional Chinese.
- Display Song, Artist and Album Info in: Bulgarian, Croatian, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Slovenian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, Turkish and Ukrainian.

## Customizable settings (iPod mini)

- Customize main menu
- Create On-The-Go playlists
- Rate songs
- Shuffle songs or albums
- Repeat one or all
- Sound Check on or off
- 20 Equalizer settings
- Backlight timer
- Display contrast
- Alarms on, off or silent
- Sleep timer
- Date and time
- Display time in menu bar
- Contacts sort and display by first or last names
- Clicker on or off
- Menu Languages: English, French, German, Japanese, Spanish, Italian, Dutch, Danish, Norwegian, Finnish, Swedish, Korean, Simplified Chinese, Traditional Chinese.

## Headphones

- Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets
- Frequency response: 20Hz to 20,000Hz
- Impedance: 32 ohms

## Input and output

- Dock connector
- 3.5-mm stereo headphone jack
- Wired remote connector

## Environmental requirements

- Operating temperature: 32° to 95° F (0° to 35° C)
- Non operating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3000 m)

## Power and battery (3)

- Built-in rechargeable lithium ion battery
- iPod playtime: Up to 12 hours when fully charged
- Standby time: 1 month when fully charged
- Charging via FireWire to computer system or power adapter
  - Fast-charge time: about 2 hours for iPod (charges up to 80% of battery capacity)
  - Full-charge time: about 4 hours
- Charging via USB 2.0 to computer system or power adapter
  - Full-charge time: about 4 hours

## Power adapter

- 6-pin FireWire connector
- AC input: 100V to 240V at 0.4 amp maximum
- Frequency: 50Hz to 60Hz
- DC output: 12V at 1 amp maximum

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Capacity based on 4 minutes per song and 128-Kbps AAC encoding.

3. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

4. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

Published Date: Apr 6, 2016

# Apple Pencil - Technical Specification



## Overview

Apple Pencil expands the power of iPad Pro and opens up new creative possibilities. It's sensitive to pressure and tilt so you can easily vary line weight, create subtle shading, and produce a wide range of artistic effects — just like with a conventional pencil, but with pixel-perfect precision.

## What's in the Box

- Apple Pencil
- Lightning adapter
- Extra tip

## Dimensions

- Length: 6.92 inches (175.7 mm) measured from tip to cap
- Diameter: 0.35 inch (8.9 mm)
- Weight: 0.73 ounce (20.7 grams)

## Connections

- Bluetooth
- Lightning connector

## Other Features

- Magnetically attached cap

## Compatibility

- **iPad Models**
  - iPad Pro 10.5-inch
  - iPad Pro 12.9-inch (2nd Generation)
  - iPad Pro 12.9-inch (1st Generation)
  - iPad Pro 9.7-inch

Published Date: Mar 19, 2018

# MacBook (Retina, 12-inch, Early 2016) - Technical Specifications



## Finish

- Rose Gold
- Space Gray
- Gold
- Silver

## Display

- Retina display
- 12-inch (diagonal) LED-backlit display with IPS technology
- 2304-by-1440 resolution at 226 pixels per inch with support for millions of colors
- 16:10 aspect ratio
- Supported scaled resolutions:
  - 1440 by 900
  - 1280 by 800
  - 1024 by 640

## Processor

- **1.1GHz**  
1.1GHz dual-core Intel Core m3 processor (Turbo Boost up to 2.2GHz) with 4MB L3 cache  
*Configurable to 1.3GHz dual-core Intel Core m7 processor (Turbo Boost up to 3.1GHz) with 4MB L3 cache.*
- **1.2GHz**  
1.2GHz dual-core Intel Core m5 processor (Turbo Boost up to 2.7GHz) with 4MB L3 cache  
*Configurable to 1.3GHz dual-core Intel Core m7 processor (Turbo Boost up to 3.1GHz) with 4MB L3 cache.*

## Memory

- 8GB of 1866MHz LPDDR3 onboard memory

## Storage

- **1.1GHz**  
256GB PCIe-based onboard flash storage<sup>1</sup>
- **1.2GHz**  
512GB PCIe-based onboard flash storage<sup>1</sup>

## Size and Weight

- **Height:** 0.14–0.52 inch (0.35–1.31 cm)
- **Width:** 11.04 inches (28.05 cm)
- **Depth:** 7.74 inches (19.65 cm)
- **Weight:** 2.03 pounds (0.92 kg)<sup>2</sup>

## Graphics and Video Support

- Intel HD Graphics 515
- Dual display and video mirroring: simultaneously supports full native resolution on the built-in display and up to 3840 by 2160 pixels at 30Hz

on an external display, both at millions of colors

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Charging and Expansion

- 
- USB-C port with support for:
    - Charging
    - USB 3.1 Gen 1 (up to 5 Gbps)
    - Native DisplayPort 1.2 video output
    - VGA output using USB-C VGA Multiport Adapter (sold separately)
    - HDMI video output using USB-C Digital AV Multiport Adapter (sold separately)

## Camera

- 480p FaceTime camera

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack
  - Support for Apple iPhone headset with remote and microphone

## Keyboard and Trackpad

- Full-size keyboard with 78 (U.S.) or 79 (ISO) individual LED backlit keys, including 12 function keys and 4 arrow keys with ambient light sensor
- Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Battery and Power

- Up to 10 hours wireless web<sup>3</sup>
- Up to 11 hours iTunes movie playback<sup>3</sup>
- Up to 30 days of standby time<sup>3</sup>
- Built-in 41.4-watt-hour lithium-polymer battery
- 29W USB-C Power Adapter; USB-C power port

## Electrical and Operating Requirements

- Line voltage: 100V–240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

### macOS Sierra

macOS is the operating system that powers everything you do on a Mac. macOS Sierra introduces Siri to Mac<sup>4</sup> — along with new ways to enjoy

your photos, shop more securely online, and work more seamlessly between devices. [Learn more](#)

Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

Built-in Apps<sup>5</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Safari
- Mail
- Messages
- FaceTime
- Calendar
- Notes
- App Store
- iTunes
- iBooks
- Maps
- Contacts
- Reminders

Limited Warranty and Service

Your MacBook comes with 90 days of free telephone support and a one-year limited warranty. Purchase the [AppleCare Protection Plan](#) to extend your service and support to three years from your computer’s purchase date. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit [Apple Support](#) or call 800-823-2775.

Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.25 ( $K_v = 0.25$ )	3.5
Wireless web	1.25 ( $K_v = 0.25$ )	3.5

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 1.2GHz dual-core Intel Core m5 processor, 8GB memory, 512GB storage, Intel HD Graphics 515.

## Accessories

### Adapters

- USB-C to USB Adapter
- USB-C Digital AV Multiport Adapter
- USB-C VGA Multiport Adapter
- USB-C to Lightning Cable
- Power Adapter Extension Cable

### AirPort and Wireless

- AirPort Extreme
- AirPort Express
- AirPort Time Capsule

### Other Accessories

- Apple USB SuperDrive
- AppleCare Protection Plan
- Apple Magic Mouse 2
- Apple Magic Trackpad 2
- Apple Magic Keyboard
- World Travel Adapter Kit

### In the Box

- MacBook
- 29W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Configure to Order

Configure your MacBook to order with this option, only at [apple.com](https://apple.com).

- 1.3GHz dual-core Intel Core m7 processor (Turbo Boost up to 3.1GHz) with 4MB L3 cache

## MacBook and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook is designed with the following features to reduce its environmental impact:

- Mercury-free display
- Arsenic-free display glass
- BFR-free
- PVC-free
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR Version 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Recycling

Apple takes a holistic view of materials management and waste minimization. [Learn more](#) about how to recycle your Mac.

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Testing conducted by Apple in March 2016 using preproduction 1.2GHz dual-core Intel Core m5-based 12-inch MacBook systems with 512GB of flash storage (wireless web test and HD movie playback test) as well as preproduction 1.2GHz dual-core Intel Core m5-based 12-inch MacBook systems with 512GB of flash storage and 1.1GHz Intel Core m3-based 12-inch MacBook systems with 256GB of flash storage (standby test), all configured with 8GB of RAM. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back

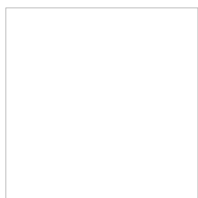
# 741\_MacBook (Retina, 12-inch, Early 2016) - Technical Specifications.pdf

HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

4. Siri may not be available in all languages or in all areas, and features may vary by area.
5. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
6. MacBook achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Nov 1, 2017

# macOS Sierra - Technical Specifications



## General Requirements

- OS X 10.7.5 or later
- 2GB of memory
- 8.8GB of available storage
- Some features require an Apple ID; terms apply.
- Some features require a compatible Internet service provider; fees may apply.

## Mac Hardware Requirements

For details about your Mac model, click the Apple icon at the top left of your screen, choose About This Mac, then choose More Info. These Mac models are compatible with macOS Sierra:

- MacBook (Late 2009 or newer)
- MacBook Pro (Mid 2010 or newer)
- MacBook Air (Late 2010 or newer)
- Mac mini (Mid 2010 or newer)
- iMac (Late 2009 or newer)
- Mac Pro (Mid 2010 or newer)

## Feature Requirements

### Handoff, Instant Hotspot, and Universal Clipboard

Supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro (2012 or newer)
- MacBook Air (2012 or newer)
- Mac mini (2012 or newer)
- iMac (2012 or newer)
- Mac Pro (Late 2013)

Handoff requires an iPhone, iPad, or iPod touch with a Lightning connector and iOS 8 or later.

Instant Hotspot requires an iPhone or iPad with cellular connectivity with a Lightning connector and iOS 8.1 or later. Requires Personal Hotspot service through your carrier.

### Auto Unlock

Supported by Mac models introduced in mid 2013 or later.

Requires an Apple Watch with watchOS 3 and an iPhone 5 or later.

### Siri

Requires a broadband Internet connection and microphone (built-in or external).

### Apple Pay on the Web

Supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro (2012 or newer)
- MacBook Air (2012 or newer)
- Mac mini (2012 or newer)
- iMac (2012 or newer)



# 742\_macOS Sierra - Technical Specifications.pdf

- Mac Pro (Late 2013)

Requires an iPhone 6 or later with iOS 10 or an Apple Watch with watchOS 3.

## Phone Calling

Phone calling requires an iPhone with iOS 8 or later and an activated carrier plan.

## SMS

SMS requires an iPhone with iOS 8.1 or later and an activated carrier plan.

## AirDrop

AirDrop between Mac computers and iOS devices is supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro (2012 or newer)
- MacBook Air (2012 or newer)
- Mac mini (2012 or newer)
- iMac (2012 or newer)
- Mac Pro (Late 2013)

AirDrop to iOS devices requires an iPhone, iPad, or iPod touch with a Lightning connector and iOS 7 or later.

AirDrop between two Mac computers is supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook (Late 2008 Aluminum or newer)
- MacBook Pro (Late 2008 or newer)
- MacBook Air (Late 2010 or newer)
- Mac mini (Mid 2010 or newer)
- iMac (Early 2009 or newer)
- Mac Pro (Early 2009 with AirPort Extreme card, or Mid 2010 or newer)

## Time Machine

Requires an additional hard drive or [AirPort Time Capsule](#) (sold separately).

## Metal

Supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro (Mid 2012 or newer)
- MacBook Air (Mid 2012 or newer)
- Mac mini (Late 2012 or newer)
- iMac (Late 2012 or newer)
- Mac Pro (Late 2013)

## Photo Booth

Requires a FaceTime or iSight camera (built in or external), USB video class (UVC) camera, or FireWire DV camcorder.

## FaceTime

Video calls require a built-in FaceTime camera, an iSight camera (built in or external), a USB video class (UVC) camera, or a FireWire DV camcorder; and broadband Internet connection.

[Learn more](#)

## Boot Camp

Allows Boot Camp installations of Windows 10, Windows 8.1, and Windows 7 on supported Mac models. Existing Boot Camp installations of Windows Vista and Windows XP Service Pack 2 are also supported.

[Learn more](#)

## Exchange Support

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Requires Microsoft Exchange 2013, Exchange Server 2010, or Exchange Server 2007 Service Pack 1 Update Rollup 4. Auto-setup requires enabling the Autodiscovery feature of Microsoft Exchange Server.

## Spotlight Suggestions

Requires a broadband Internet connection.

## AirPlay

AirPlay Mirroring requires an Apple TV (2nd generation or later). Supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro (Early 2011 or newer)
- MacBook Air (Mid 2011 or newer)
- Mac mini (Mid 2011 or newer)
- iMac (Mid 2011 or newer)
- Mac Pro (Late 2013)

AirPlay for web video requires an Apple TV (2nd generation or later).

Peer-to-peer AirPlay requires a Mac (2012 or later) with OS X Yosemite or later and an Apple TV (3rd generation rev A, model A1469 or later) with Apple TV software 7.0 or later.

## Power Nap

Supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro with Retina display (Mid 2012 or newer)
- MacBook Air (Late 2010 or newer)
- Mac mini (Late 2012 or newer)
- iMac (Late 2012 or newer)
- Mac Pro (Late 2013)

## Gestures

Requires a Multi-Touch trackpad, Force Touch trackpad, Magic Trackpad, or Magic Mouse.

Force Touch gestures require a Force Touch trackpad.

VoiceOver gestures require a Multi-Touch trackpad, Force Touch trackpad, or Magic Trackpad.

## Dictation

Dictation requires a microphone (built in or external).

## Mac App Store

Available only to persons age 13 or older in the U.S. and many other countries and regions.

## What's Included

### Applications

- Automator
- Calculator
- Calendar
- Chess
- Contacts
- Dashboard
- Dictionary
- DVD Player
- FaceTime
- Font Book
- iBooks
- Image Capture
- iTunes
- Launchpad

- Mac App Store
- Mail
- Maps
- Messages
- Mission Control
- Notes
- Photo Booth
- Photos
- Preview
- QuickTime Player
- Reminders
- Safari
- Siri
- Stickies
- System Preferences
- TextEdit
- Time Machine

## Utilities

- Activity Monitor
- AirPort Utility
- AppleScript Editor
- Audio MIDI Setup
- Bluetooth File Exchange
- Boot Camp Assistant
- ColorSync Utility
- Console
- Digital Color Meter
- Disk Utility
- Grab
- Grapher
- Keychain Access
- Migration Assistant
- System Information
- Terminal
- VoiceOver Utility

## Languages

- Arabic
- Catalan
- Croatian
- Simplified Chinese
- Traditional Chinese
- Czech
- Danish
- Dutch
- English
- Finnish
- French
- German
- Greek
- Hebrew
- Hungarian
- Indonesian
- Italian
- Japanese
- Korean
- Malay
- Norwegian
- Polish
- Brazilian Portuguese
- Portuguese
- Romanian

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- Russian
- Slovak
- Spanish
- Spanish (Mexico)
- Swedish
- Thai
- Turkish
- Ukrainian
- Vietnamese

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Some features may not be available for all countries or regions. [Click here to see complete list.](#)

iCloud requires iOS 5 or later on iPhone 3GS or later, iPod touch (3rd generation or later), iPad Pro, iPad Air or later, iPad or later, or iPad mini or later; a Mac computer with OS X Lion 10.7.5 or later; or a PC with Windows 7 or Windows 8 (Outlook 2007 or later or an up-to-date browser is required for accessing email, contacts, and calendars). Some features require iOS 10 and macOS Sierra. Some features require a Wi-Fi connection. Some features are not available in all countries or regions. Access to some services is limited to 10 devices.

Published Date: Jun 6, 2018

# iPhone 7 - Technical Specifications



## Finish

- Rose Gold
- Gold
- Silver
- Black
- Jet Black<sup>1</sup>
- (PRODUCT)RED™

## Capacity<sup>2</sup>

- 32GB
- 128GB
- 256GB

(PRODUCT)RED™ is exclusively available in 128GB and 256GB models.

## Size and Weight<sup>3</sup>

- Height: 5.44 inches (138.3 mm)
- Width: 2.64 inches (67.1 mm)
- Depth: 0.28 inch (7.1 mm)
- Weight: 4.87 ounces (138 grams)

## Display

- Retina HD display
- 4.7-inch (diagonal) widescreen LCD
- Multi-Touch display with IPS technology
- 1334-by-750-pixel resolution at 326 ppi
- 1400:1 contrast ratio (typical)
- Wide color display (P3)
- 625 cd/m2 max brightness (typical)
- Dual-domain pixels for wide viewing angles
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously
- Display Zoom
- Reachability

## Splash, Water, and Dust Resistant<sup>4</sup>

- Rated IP67 (maximum depth of 1 meter up to 30 minutes) under IEC standard 60529

## Chip

- A10 Fusion chip

## Camera

# 743\_iPhone 7 - Technical Specifications.pdf

- 12MP camera
- $f/1.8$  aperture
- Digital zoom up to 5x
- Optical image stabilization
- Six-element lens
- Quad-LED True Tone flash
- Panorama (up to 63MP)
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels
- Tap to focus with Focus Pixels
- Live Photos with stabilization
- Wide color capture for photos and Live Photos
- Improved local tone mapping
- Exposure control
- HDR for photos
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging
- Image formats captured: HEIF and JPEG

## Video Recording

- 4K video recording at 30 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Optical image stabilization for video
- 2x optical zoom; digital zoom up to 6x (iPhone 7 Plus only)
- Quad-LED True Tone flash
- Slo-mo video support for 1080p at 120 fps and 720p at 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Take 8MP still photos while recording 4K video
- Playback zoom
- Video geotagging
- Video formats recorded: HEVC and H.264

## FaceTime HD Camera

- 7MP camera
- 1080p HD video recording
- Retina Flash
- $f/2.2$  aperture
- Wide color capture for photos and Live Photos
- HDR for photos
- Backside illumination sensor
- Auto image stabilization
- Burst mode
- Exposure control
- Timer mode

## Touch ID

- Fingerprint sensor built into the Home button

## Apple Pay

- Pay with your iPhone using Touch ID in stores, within apps, and on the web
- Send and receive money in Messages
- Complete purchases made with Apple Pay on your Mac

[Learn more about Apple Pay](#)

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## Cellular and Wireless

- **Model A1660\***  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)  
TD-LTE (Bands 38, 39, 40, 41)  
TD-SCDMA 1900 (F), 2000 (A)  
CDMA EV-DO Rev. A (800, 1900, 2100 MHz)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1778\***  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)  
TD-LTE (Bands 38, 39, 40, 41)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **All models**  
802.11ac Wi-Fi with MIMO  
Bluetooth 4.2 wireless technology  
NFC with reader mode  
Express Cards

## Location

- Assisted GPS, GLONASS, Galileo, and QZSS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>5</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>5</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>6</sup>
- Wi-Fi calling<sup>6</sup>

## Audio Playback

- Audio formats supported: AAC-LC, HE-AAC, HE-AAC v2, Protected AAC, MP3, Linear PCM, Apple Lossless, FLAC, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), and Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+)
- User-configurable maximum volume limit

## Video Playback

- Video formats supported: HEVC, H.264, MPEG-4 Part 2, and Motion JPEG
- AirPlay Mirroring, photos, and video out to Apple TV (2nd generation or later)<sup>7</sup>
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)<sup>7</sup>

## Siri<sup>8</sup>

- Use your voice to send messages, set reminders, and more
- Get intelligent suggestions on your Lock screen and in Messages, Mail, QuickType, and more
- Activate hands-free with only your voice using “Hey Siri”
- Use your voice to run shortcuts from your favorite apps

[Learn more about Siri](#)

## External Buttons and Connectors

- Home/Touch ID sensor
- Volume up/down

# 743\_iPhone 7 - Technical Specifications.pdf

- Ring/Silent switch
- Side button
- Built-in stereo speaker
- Built-in microphone
- Lightning connector

## Power and Battery<sup>9</sup>

Lasts up to 2 hours longer than iPhone 6s

- Talk time (wireless): Up to 14 hours on 3G
- Standby: Up to 10 days
- Internet use: Up to 12 hours on 3G, Up to 12 hours on LTE, Up to 14 hours on Wi-Fi
- Wireless video playback: Up to 13 hours
- Wireless audio playback: Up to 40 hours
- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter

## Sensors

- Touch ID fingerprint sensor
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 12

iOS is the world's most personal and secure mobile operating system, packed with powerful features that help you get the most out of every day.

[See what's new in iOS 12](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPhone 7. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can fully enjoy the world's most personal device. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- RTT and TTY support
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Siri
- Calendar



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- iTunes Store
- App Store
- Notes
- News
- Contacts
- Books
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Find My iPhone
- Find My Friends
- Settings
- Files
- Measure

## Free Apps from Apple

Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.

- iMovie
- Pages
- Keynote
- Numbers
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips
- Shortcuts

## Headphones

- EarPods with Lightning Connector

## SIM Card

- Nano-SIM  
*iPhone 7 and iPhone 7 Plus are not compatible with existing micro-SIM cards.*

## Rating for Hearing Aids

- iPhone 7 (Model A1660, A1778): M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics; .usdz (USDZ Universal)

## System Requirements

- Apple ID (required for some features)

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- Internet access<sup>10</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X 10.11.6 or later
- PC: Windows 7 or later
- iTunes 12.8 or later on Mac and iTunes 12.9 or later on PC (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

- **Language support**

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **QuickType keyboard support**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

- **QuickType keyboard support with predictive input**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

- **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

- **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

- **Thesaurus**

English (UK, U.S.)

- **Bilingual dictionary support with English**

Arabic, Chinese (Simplified, Traditional), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish

- **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPhone with iOS 12
- EarPods with Lightning Connector
- Lightning to USB Cable

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- USB Power Adapter
- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPhone 7 and iPhone 7 Plus embody Apple's continuing environmental progress. They are designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- Mercury-free LED-backlit display
- Brominated flame retardant-free
- PVC-free
- Recyclable aluminum enclosure

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

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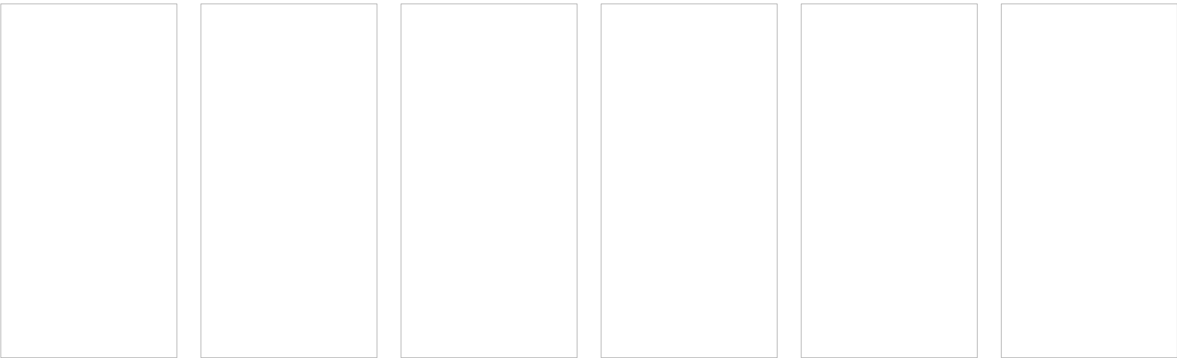
\* To identify your iPhone model number, see <https://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

1. The high-gloss finish of the jet black iPhone 7 is achieved through a precision nine-step anodization and polishing process. Its surface is equally as hard as other anodized Apple products; however, its high shine may show fine micro-abrasions with use. If you are concerned about this, we suggest you use one of the many cases available to protect your iPhone.
2. Available space is less and varies due to many factors. A standard configuration uses approximately 10GB to 12GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
3. Size and weight vary by configuration and manufacturing process.
4. iPhone 7 and iPhone 7 Plus are splash, water, and dust resistant and were tested under controlled laboratory conditions with a rating of IP67 under IEC standard 60529 (maximum depth of 1 meter up to 30 minutes). Splash, water, and dust resistance are not permanent conditions and resistance might decrease as a result of normal wear. Do not attempt to charge a wet iPhone; refer to the user guide for cleaning and drying instructions. Liquid damage not covered under warranty.
5. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
6. Data plan required. LTE Advanced, LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
7. Standard Dynamic Range video content only.
8. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
9. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
10. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Published Date: Sep 18, 2018

# iPhone 7 Plus - Technical Specifications



## Finish

- Rose Gold
- Gold
- Silver
- Black
- Jet Black<sup>1</sup>
- (PRODUCT)RED™

## Capacity<sup>2</sup>

- 32GB
- 128GB
- 256GB

*(PRODUCT)RED™ is exclusively available in 128GB and 256GB models.*

## Size and Weight<sup>3</sup>

- Height: 6.23 inches (158.2 mm)
- Width: 3.07 inches (77.9 mm)
- Depth: 0.29 inch (7.3 mm)
- Weight: 6.63 ounces (188 grams)

## Display

- Retina HD display
- 5.5-inch (diagonal) widescreen LCD
- Multi-Touch display with IPS technology
- 1920-by-1080-pixel resolution at 401 ppi
- 1300:1 contrast ratio (typical)
- Wide color display (P3)
- 625 cd/m2 max brightness (typical)
- Dual-domain pixels for wide viewing angles
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously
- Display Zoom
- Reachability

## Splash, Water, and Dust Resistant<sup>4</sup>

- Rated IP67 (maximum depth of 1 meter up to 30 minutes) under IEC standard 60529

## Chip

- A10 Fusion chip

## Camera

# 744\_iPhone 7 Plus - Technical Specifications.pdf

- Dual 12MP wide-angle and telephoto cameras
- Wide-angle: *f*/1.8 aperture
- Telephoto: *f*/2.8 aperture
- 2x optical zoom; digital zoom up to 10x
- Portrait mode
- Optical image stabilization
- Six-element lens
- Quad-LED True Tone flash
- Panorama (up to 63MP)
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels
- Tap to focus with Focus Pixels
- Live Photos with stabilization
- Wide color capture for photos and Live Photos
- Improved local tone mapping
- Exposure control
- HDR for photos
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging
- Image formats captured: HEIF and JPEG

## Video Recording

- 4K video recording at 30 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Optical image stabilization for video
- 2x optical zoom; digital zoom up to 6x (iPhone 7 Plus only)
- Quad-LED True Tone flash
- Slo-mo video support for 1080p at 120 fps and 720p at 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Take 8MP still photos while recording 4K video
- Playback zoom
- Video geotagging
- Video formats recorded: HEVC and H.264

## FaceTime HD Camera

- 7MP camera
- 1080p HD video recording
- Retina Flash
- *f*/2.2 aperture
- Wide color capture for photos and Live Photos
- HDR for photos
- Backside illumination sensor
- Auto image stabilization
- Burst mode
- Exposure control
- Timer mode

## Touch ID

- Fingerprint sensor built into the Home button

## Apple Pay

- Pay with your iPhone using Touch ID in stores, within apps, and on the web
- Send and receive money in Messages
- Complete purchases made with Apple Pay on your Mac

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1661\***  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)  
TD-LTE (Bands 38, 39, 40, 41)  
TD-SCDMA 1900 (F), 2000 (A)  
CDMA EV-DO Rev. A (800, 1900, 2100 MHz)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1784\***  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 27, 28, 29, 30)  
TD-LTE (Bands 38, 39, 40, 41)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **All models**  
802.11ac Wi-Fi with MIMO  
Bluetooth 4.2 wireless technology  
NFC with reader mode  
Express Cards

## Location

- Assisted GPS, GLONASS, Galileo, and QZSS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>5</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>5</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>6</sup>
- Wi-Fi calling<sup>6</sup>

## Audio Playback

- Audio formats supported: AAC-LC, HE-AAC, HE-AAC v2, Protected AAC, MP3, Linear PCM, Apple Lossless, FLAC, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), and Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+)
- User-configurable maximum volume limit

## Video Playback

- Video formats supported: HEVC, H.264, MPEG-4 Part 2, and Motion JPEG
- AirPlay Mirroring, photos, and video out to Apple TV (2nd generation or later)<sup>7</sup>
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)<sup>7</sup>

## Siri<sup>8</sup>

- Use your voice to send messages, set reminders, and more
- Get intelligent suggestions on your Lock screen and in Messages, Mail, QuickType, and more
- Activate hands-free with only your voice using “Hey Siri”
- Use your voice to run shortcuts from your favorite apps

[Learn more about Siri](#)

## External Buttons and Connectors

# 744\_iPhone 7 Plus - Technical Specifications.pdf

- Home/Touch ID sensor
- Volume up/down
- Ring/Silent switch
- Side button
- Built-in stereo speaker
- Built-in microphone
- Lightning connector

## Power and Battery<sup>9</sup>

Lasts up to 1 hour longer than iPhone 6s Plus

- Talk time (wireless): Up to 21 hours on 3G
- Standby: Up to 16 days
- Internet use: Up to 13 hours on 3G, Up to 13 hours on LTE, Up to 15 hours on Wi-Fi
- Wireless video playback: Up to 14 hours
- Wireless audio playback: Up to 60 hours
- Built-in rechargeable lithium-ion battery
- Charging via USB to computer system or power adapter

## Sensors

- Touch ID fingerprint sensor
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 12

iOS is the world's most personal and secure mobile operating system, packed with powerful features that help you get the most out of every day.

[See what's new in iOS 12](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPhone 7. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can fully enjoy the world's most personal device. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- RTT and TTY support
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps

# 744\_iPhone 7 Plus - Technical Specifications.pdf

- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- News
- Contacts
- Books
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Find My iPhone
- Find My Friends
- Settings
- Files
- Measure

## Free Apps from Apple

Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.

- iMovie
- Pages
- Keynote
- Numbers
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips
- Shortcuts

## Headphones

- EarPods with Lightning Connector

## SIM Card

- Nano-SIM  
*iPhone 7 and iPhone 7 Plus are not compatible with existing micro-SIM cards.*

## Rating for Hearing Aids

- iPhone 7 Plus (Model A1661, A1784): M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics; .usdz (USDZ Universal)

## System Requirements



# 744\_iPhone 7 Plus - Technical Specifications.pdf

- Apple ID (required for some features)
- Internet access<sup>10</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X 10.11.6 or later
- PC: Windows 7 or later
- iTunes 12.8 or later on Mac and iTunes 12.9 or later on PC (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

### • **Language support**

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • **QuickType keyboard support**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

### • **QuickType keyboard support with predictive input**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

### • **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

### • **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

### • **Thesaurus**

English (UK, U.S.)

### • **Bilingual dictionary support with English**

Arabic, Chinese (Simplified, Traditional), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish

### • **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPhone with iOS 12
- EarPods with Lightning Connector

# 744\_iPhone 7 Plus - Technical Specifications.pdf

- Lightning to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPhone 7 and iPhone 7 Plus embody Apple's continuing environmental progress. They are designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- Mercury-free LED-backlit display
- Brominated flame retardant-free
- PVC-free
- Recyclable aluminum enclosure

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

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\* To identify your iPhone model number, see <http://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

1. The high-gloss finish of the jet black iPhone 7 is achieved through a precision nine-step anodization and polishing process. Its surface is equally as hard as other anodized Apple products; however, its high shine may show fine micro-abrasions with use. If you are concerned about this, we suggest you use one of the many cases available to protect your iPhone.
2. Available space is less and varies due to many factors. A standard configuration uses approximately 10GB to 12GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
3. Size and weight vary by configuration and manufacturing process.
4. iPhone 7 and iPhone 7 Plus are splash, water, and dust resistant and were tested under controlled laboratory conditions with a rating of IP67 under IEC standard 60529 (maximum depth of 1 meter up to 30 minutes). Splash, water, and dust resistance are not permanent conditions and resistance might decrease as a result of normal wear. Do not attempt to charge a wet iPhone; refer to the user guide for cleaning and drying instructions. Liquid damage not covered under warranty.
5. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
6. Data plan required. LTE Advanced, LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
7. Standard Dynamic Range video content only.
8. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
9. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
10. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Published Date: Sep 18, 2018

# Apple Watch Series 1 - Technical Specifications

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## Series 1

- **Apple Watch**
  - Aluminum case with Sport Band

## Dimensions

- **38mm**
  - Height: 38.6mm
  - Width: 33.3mm
  - Depth: 10.5mm
  - Case Weight: 25g
- **42mm**
  - Height: 42.5mm
  - Width: 36.4mm
  - Depth: 10.5mm
  - Case Weight: 30g

## Chip

- Dual-core processor

## Features

- Splash resistant<sup>1</sup>
- Heart rate sensor
- Accelerometer
- Gyroscope
- Ambient light sensor
- Capacity 8GB
- Composite back

## Connectivity

- Wi-Fi (802.11b/g/n 2.4GHz)
- Bluetooth 4.2

## Display

- OLED Retina display with Force Touch (450 nits)
- Ion-X glass (strengthened glass)
- 272 by 340 pixels (38mm)
- 312 by 390 pixels (42mm)

## Power and Battery

- Built-in rechargeable lithium-ion battery
- Up to 18 hours<sup>2</sup>
- Magnetic charging cable

## Languages

# 745\_Apple Watch Series 1 - Technical Specifications.pdf

- **Language support**

English (Australia, Canada, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Russian (Russia), Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)

- **Dictation languages**

English (Australia, Canada, India, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, UAE, UK, U.S.), Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Kuwait, Saudi Arabia, Qatar, UAE), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Luxembourg, Netherlands), Finnish, Greek, Hebrew, Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovakian, Swedish, Turkish, Thai, Ukrainian, Vietnamese

- 
1. Apple Watch Series 1 has a water resistance rating of IPX7 under IEC standard 60529. Apple Watch Series 1 is splash and water resistant, but submerging Apple Watch Series 1 is not recommended.
  2. Apple Watch battery testing was conducted by Apple in August 2016 using preproduction Apple Watch Series 1 paired with an iPhone; all devices were tested with prerelease software. Battery life varies by use, configuration, and many other factors; actual results will vary. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/watch/battery.html](http://www.apple.com/watch/battery.html) for more information.

Apple Watch Series 1 requires an iPhone 5s or later with iOS 11 or later.

Some features may not be available for all countries or regions. [Click here](#) to see complete list.

To learn more about wearing Apple Watch, getting a good fit, potential skin sensitivity, and proper care and cleaning, [click here](#).

All models come in distinct case and band combinations. Sport, Woven Nylon, stainless steel, and leather bands are all compatible with all Apple Watch models.

Published Date: Nov 30, 2017

# Apple Watch Series 2 - Technical Specifications

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## Series 2

With built-in GPS and GLONASS, water resistance to 50 meters,<sup>1</sup> a dual-core processor, a 2x brighter display, and watchOS 3.

- **Apple Watch**
  - Aluminum case with Sport Band or Woven Nylon band
  - Stainless steel case with Sport Band, stainless steel band, or leather band
- **Apple Watch Nike+**
  - Aluminum case with Nike Sport Band
- **Apple Watch Hermès**
  - Stainless steel case with Hermès leather band
  - Additional Sport Band included with purchase
- **Apple Watch Edition**
  - Ceramic case with Sport Band
  - Magnetic Charging Dock included with purchase

## Dimensions

- **Aluminum case - 38mm**
  - Height: 38.6mm
  - Width: 33.3mm
  - Depth: 11.4mm
  - Case Weight: 28.2g
- **Aluminum case - 42mm**
  - Height: 42.5mm
  - Width: 36.4mm
  - Depth: 11.4mm
  - Case Weight: 34.2g
- **Stainless Steel case - 38mm**
  - Height: 38.6mm
  - Width: 33.3mm
  - Depth: 11.4mm
  - Case Weight: 41.9g
- **Stainless Steel case - 42mm**
  - Height: 42.5mm
  - Width: 36.4mm
  - Depth: 11.4mm
  - Case Weight: 52.4g
- **White Ceramic case - 38mm**
  - Height: 39.2mm
  - Width: 34.0mm
  - Depth: 11.8mm
  - Case Weight: 39.6g
- **White Ceramic case - 42mm**
  - Height: 42.6mm
  - Width: 36.5mm
  - Depth: 11.4mm
  - Case Weight: 45.6g

## Chip

# 746\_Apple Watch Series 2 - Technical Specifications.pdf

- Dual-core processor
- Built-in GPS and GLONASS

## Features

- Built-in GPS and GLONASS
- Water resistant 50 meters<sup>1</sup>
- Wi-Fi (802.11b/g/n 2.4GHz)
- Bluetooth 4.0
- Heart rate sensor
- Accelerometer
- Gyroscope
- Ambient light sensor

## Display

- Second-generation OLED Retina display with Force Touch 2x brighter (1000 nits)
- Sapphire crystal (stainless steel and ceramic cases)
- Ion-X glass (aluminum cases)
- 272 by 340 pixels (38mm)
- 312 by 390 pixels (42mm)

## Power and Battery

- Built-in rechargeable lithium-ion battery
- Up to 18 hours<sup>2</sup>
- Magnetic charging cable
- USB power adapter

## Languages

- **Language support**  
English (Australia, Canada, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **Siri languages**  
English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Russian (Russia), Swedish (Sweden), Turkish (Turkey), Thai (Thailand), Portuguese (Brazil)
- **Dictation languages**  
English (Australia, Canada, India, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, UAE, UK, U.S.), Spanish (Chile, Colombia, Mexico, Spain, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Hong Kong), Arabic (Kuwait, Saudi Arabia, Qatar, UAE), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Luxembourg, Netherlands), Finnish, Greek, Hebrew, Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovakian, Swedish, Turkish, Thai, Ukrainian, Vietnamese

- 
1. Apple Watch Series 2 has a water resistance rating of 50 meters under ISO standard 22810:2010. This means that it may be used for shallow-water activities like swimming in a pool or ocean. It is also safe to wear it while showering or in a hot tub. However, Apple Watch Series 2 should not be used for scuba diving, waterskiing, or other activities involving high-velocity water or submersion below shallow depth.
  2. Apple Watch battery testing was conducted by Apple in August 2016 using preproduction Apple Watch Series 1, Apple Watch Series 2, and Apple Watch Edition, each paired with an iPhone; all devices were tested with prerelease software. Battery life varies by use, configuration, and many other factors; actual results will vary. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/watch/battery.html](http://www.apple.com/watch/battery.html) for more information.

Some features are not available in all regions or all languages. Requires iPhone 5 or later.

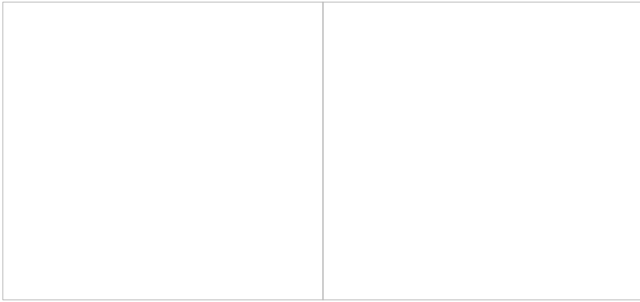
To learn more about wearing Apple Watch, getting a good fit, potential skin sensitivity, and proper care and cleaning, [click here](#).

All models come in distinct case and band combinations. Sport, Woven Nylon, stainless steel, and leather bands are all compatible with all Apple Watch models.

# 746\_Apple Watch Series 2 - Technical Specifications.pdf

Published Date: Mar 19, 2018

# MacBook Pro (13-inch, 2016, Two Thunderbolt 3 Ports) - Technical Specifications



## Finish

- Silver
- Space Gray

## Display

- Retina display
- 13.3-inch (diagonal) LED-backlit display with IPS technology; 2560-by-1600 native resolution at 227 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 1680 by 1050
  - 1440 by 900
  - 1024 by 640
- 500 nits brightness
- Wide color gamut (P3)

## Processor

- 2.0GHz dual-core Intel Core i5, Turbo Boost up to 3.1GHz, with 4MB shared L3 cache  
*Configurable to 2.4GHz dual-core Intel Core i7, Turbo Boost up to 3.4GHz, with 4MB shared L3 cache*

## Storage<sup>1</sup>

- **256GB**  
256GB PCIe-based onboard SSD  
*Configurable to 512GB or 1TB SSD*

## Memory

- 8GB of 1866MHz LPDDR3 onboard memory  
*Configurable to 16GB of memory*

## Graphics

- Intel Iris Graphics 540

## Charging and Expansion

Two Thunderbolt 3 (USB-C) ports with support for:

- Charging
- DisplayPort
- Thunderbolt (up to 40 Gbps)
- USB 3.1 Gen 2 (up to 10 Gbps)

## Keyboard and Trackpad

- **Full-size backlit keyboard with:**
  - 78 (U.S.) or 79 (ISO) keys including 12 function keys and 4 arrow keys



# 747\_MacBook Pro (13-inch, 2016, Two Thunderbolt 3 Ports) - Technical Specifications.pdf

- Ambient light sensor
- Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Camera

- 720p FaceTime HD camera

## Video Support

Simultaneously supports full native resolution on the built-in display at millions of colors and:

- One display with 5120-by-2880 resolution at 60Hz at over a billion colors
- Up to two displays with 4096-by-2304 resolution at 60Hz at over a billion colors

Thunderbolt 3 digital video output

- Native DisplayPort output over USB-C
- VGA, HDMI, and Thunderbolt 2 output supported using adapters (sold separately)

## Audio

- Stereo speakers with high dynamic range
- Two microphones
- 3.5 mm headphone jack

## Battery and Power<sup>2</sup>

- Up to 10 hours wireless web
- Up to 10 hours iTunes movie playback
- Up to 30 days of standby time
- Built-in 54.5-watt-hour lithium-polymer battery
- 61W USB-C Power Adapter

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and Weight

- Height: 0.59 inch (1.49 cm)
- Width: 11.97 inches (30.41 cm)
- Depth: 8.36 inches (21.24 cm)
- Weight: 3.02 pounds (1.37 kg)<sup>3</sup>

## Operating System

### macOS Sierra

macOS is the operating system that powers everything you do on a Mac. macOS Sierra introduces Siri to Mac<sup>4</sup> — along with new ways to enjoy your photos, shop more securely online, and work more seamlessly between devices.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>5</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## What's in the Box

- 13-inch MacBook Pro
- 61W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Limited Warranty and Service

Every Mac comes with a [one-year limited warranty](#) and up to 90 days of [complimentary telephone technical support](#). Extend your coverage to three years from your Mac original purchase date with the AppleCare Protection Plan. You'll get direct, one-stop access to Apple's award-winning technical support for questions about your Mac, macOS, and Apple-branded applications such as Photos, iMovie, GarageBand, Pages, Numbers, Keynote, and more. In addition, you'll get 24/7 priority access to Apple experts via chat or phone through [getsupport.apple.com](#). You can even get local repair service when you visit other countries around the world.

## Configure to Order

Configure your MacBook Pro with these options, only at [apple.com](#):

- 2.4GHz dual-core Intel Core i7, Turbo Boost up to 3.4GHz, with 4MB shared L3 cache
- 16GB of 1866MHz LPDDR3 onboard memory
- 512GB or 1TB PCIe-based onboard SSD

## MacBook Pro and the Environment

# 747\_MacBook Pro (13-inch, 2016, Two Thunderbolt 3 Ports) - Technical Specifications.pdf

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Pro is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>6</sup>
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>7</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Recycling

Apple takes a holistic view of materials management and waste minimization.

[Learn more about how to recycle your Mac](#)

## Accessories

### Mac Software

- Final Cut Pro X
- Logic Pro X

### Displays and Adapters

- LG UltraFine 4K Display
- LG UltraFine 5K Display
- Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter
- USB-C to USB Adapter
- USB-C Digital AV Multiport Adapter
- USB-C VGA Multiport Adapter
- USB-C to Gigabit Ethernet Adapter

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

### Other Accessories

- USB-C to Lightning Cable
- USB-C Charge Cable
- 61W USB-C Power Adapter
- Magic Keyboard
- Magic Trackpad 2
- Magic Mouse 2

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.25 ( $K_V=0.25$ )	3.5
Wireless web	1.25 ( $K_V=0.25$ )	3.5

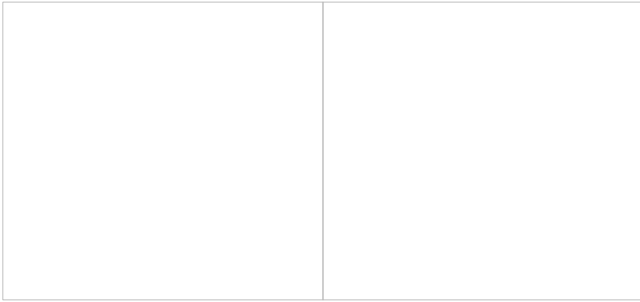
1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)

4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
  5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
  6. The Wireless web test browses 25 popular websites.
  7. Configuration tested: 2GHz dual-core Intel i5 processor, 8GB memory, 1TB storage, Intel Iris Graphics 540 1536 MB.
- 

1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
2. Testing conducted by Apple in October 2016 using preproduction 2.0GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with a 256GB SSD and 8GB of RAM (wireless web test, iTunes movie playback test, and standby test). Testing conducted by Apple in October 2016 using preproduction 2.9GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with a 512GB SSD and 8GB of RAM (wireless web test and iTunes movie playback test) and preproduction 2.9GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with a 256GB SSD and 8GB of RAM (standby test). The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
3. Weight varies by configuration and manufacturing process.
4. Siri may not be available in all languages or in all areas, and features may vary by area.
5. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
6. PVC-free AC power cord available in all regions except India and South Korea.
7. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Nov 1, 2017

# MacBook Pro (13-inch, 2016, Four Thunderbolt 3 Ports) - Technical Specifications



## Touch Bar

- Touch Bar with integrated Touch ID sensor

## Finish

- Silver
- Space Gray

## Display

- Retina display
- 13.3-inch (diagonal) LED-backlit display with IPS technology; 2560-by-1600 native resolution at 227 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 1680 by 1050
  - 1440 by 900
  - 1024 by 640
- 500 nits brightness
- Wide color gamut (P3)

## Processor

- 2.9GHz dual-core Intel Core i5, Turbo Boost up to 3.3GHz, with 4MB shared L3 cache  
*Configurable to 3.1GHz dual-core Intel Core i5, Turbo Boost up to 3.5GHz, with 4MB shared L3 cache; or 3.3GHz dual-core Intel Core i7, Turbo Boost up to 3.6GHz, with 4MB shared L3 cache*

## Storage<sup>1</sup>

- **256GB**  
256GB PCIe-based onboard SSD
- **512GB**  
512GB PCIe-based onboard SSD  
*Configurable to 1TB SSD*

## Memory

- 8GB of 2133MHz LPDDR3 onboard memory  
*Configurable to 16GB of memory*

## Graphics

- Intel Iris Graphics 550

## Charging and Expansion

Four Thunderbolt 3 (USB-C) ports with support for:

- Charging
- DisplayPort

# 748\_MacBook Pro (13-inch, 2016, Four Thunderbolt 3 Ports) - Technical Specifications.pdf

- Thunderbolt (up to 40 Gbps)
- USB 3.1 Gen 2 (up to 10 Gbps)

## Keyboard and Trackpad

- **Full-size backlit keyboard with:**
  - 64 (U.S.) or 65 (ISO) keys including 4 arrow keys
  - Touch Bar with integrated Touch ID sensor
  - Ambient light sensor
  - Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Camera

- 720p FaceTime HD camera

## Video Support

Simultaneously supports full native resolution on the built-in display at millions of colors and:

- One display with 5120-by-2880 resolution at 60Hz at over a billion colors
- Up to two displays with 4096-by-2304 resolution at 60Hz at over a billion colors

Thunderbolt 3 digital video output

- Native DisplayPort output over USB-C
- VGA, HDMI, and Thunderbolt 2 output supported using adapters (sold separately)

## Audio

- Stereo speakers with high dynamic range
- Three microphones
- 3.5 mm headphone jack

## Battery and Power<sup>2</sup>

- Up to 10 hours wireless web
- Up to 10 hours iTunes movie playback
- Up to 30 days of standby time
- Built-in 49.2-watt-hour lithium-polymer battery
- 61W USB-C Power Adapter

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and Weight

- Height: 0.59 inch (1.49 cm)
- Width: 11.97 inches (30.41 cm)
- Depth: 8.36 inches (21.24 cm)
- Weight: 3.02 pounds (1.37 kg)<sup>3</sup>

## Operating System

### macOS Sierra

macOS is the operating system that powers everything you do on a Mac. macOS Sierra introduces Siri to Mac<sup>4</sup> — along with new ways to enjoy your photos, shop more securely online, and work more seamlessly between devices.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>5</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## What's in the Box

- 13-inch MacBook Pro
- 61W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Limited Warranty and Service

Every Mac comes with a [one-year limited warranty](#) and up to 90 days of [complimentary telephone technical support](#). Extend your coverage to three years from your Mac original purchase date with the AppleCare Protection Plan. You'll get direct, one-stop access to Apple's award-winning technical support for questions about your Mac, macOS, and Apple-branded applications such as Photos, iMovie, GarageBand, Pages, Numbers, Keynote, and more. In addition, you'll get 24/7 priority access to Apple experts via chat or phone through [getsupport.apple.com](https://getsupport.apple.com). You can even get local repair service when you visit other countries around the world.

## Configure to Order

# 748\_MacBook Pro (13-inch, 2016, Four Thunderbolt 3 Ports) - Technical Specifications.pdf

Configure your MacBook Pro with these options, only at [apple.com](https://apple.com):

- 3.1GHz dual-core Intel Core i5, Turbo Boost up to 3.5GHz, with 4MB shared L3 cache; or 3.3GHz dual-core Intel Core i7, Turbo Boost up to 3.6GHz, with 4MB shared L3 cache
- 16GB of 2133MHz LPDDR3 onboard memory
- 1TB PCIe-based onboard SSD

## MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Pro is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>6</sup>
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>7</sup>

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## Recycling

Apple takes a holistic view of materials management and waste minimization.

[Learn more about how to recycle your Mac](#)

## Accessories

### Mac Software

- Final Cut Pro X
- Logic Pro X

### Displays and Adapters

- LG UltraFine 4K Display
- LG UltraFine 5K Display
- Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter
- USB-C to USB Adapter
- USB-C Digital AV Multiport Adapter
- USB-C VGA Multiport Adapter
- USB-C to Gigabit Ethernet Adapter

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

### Other Accessories

- USB-C to Lightning Cable
- USB-C Charge Cable
- 61W USB-C Power Adapter
- Magic Keyboard
- Magic Trackpad 2
- Magic Mouse 2

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109



	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.25 ( $K_v=0.25$ )	3.5
Wireless web	1.25 ( $K_v=0.25$ )	4.0

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.9GHz dual-core Intel Core i5 processor, 8GB memory, 256GB storage, Intel Iris Graphics 550 1536 MB.

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Testing conducted by Apple in October 2016 using preproduction 2.0GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with a 256GB SSD and 8GB of RAM (wireless web test, iTunes movie playback test, and standby test). Testing conducted by Apple in October 2016 using preproduction 2.9GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with a 512GB SSD and 8GB of RAM (wireless web test and iTunes movie playback test) and preproduction 2.9GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with a 256GB SSD and 8GB of RAM (standby test). The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  3. Weight varies by configuration and manufacturing process.
  4. Siri may not be available in all languages or in all areas, and features may vary by area.
  5. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  6. PVC-free AC power cord available in all regions except India and South Korea.
  7. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Nov 1, 2017

# MacBook Pro (15-inch, 2016) - Technical Specifications



## Touch Bar

- Touch Bar with integrated Touch ID sensor

## Finish

- Silver
- Space Gray

## Display

- Retina display
- 15.4-inch (diagonal) LED-backlit display with IPS technology; 2880-by-1800 native resolution at 220 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 1920 by 1200
  - 1680 by 1050
  - 1280 by 800
  - 1024 by 640
- 500 nits brightness
- Wide color gamut (P3)

## Processor

- **2.6GHz**  
2.6GHz quad-core Intel Core i7, Turbo Boost up to 3.5GHz, with 6MB shared L3 cache  
*Configurable to 2.9GHz quad-core Intel Core i7, Turbo Boost up to 3.8GHz, with 8MB shared L3 cache*
- **2.7GHz**  
2.7GHz quad-core Intel Core i7, Turbo Boost up to 3.6GHz, with 8MB shared L3 cache  
*Configurable to 2.9GHz quad-core Intel Core i7, Turbo Boost up to 3.8GHz, with 8MB shared L3 cache*

## Storage<sup>1</sup>

- **256GB**  
256GB PCIe-based onboard SSD  
*Configurable to 512GB, 1TB, or 2TB SSD*
- **512GB**  
512GB PCIe-based onboard SSD  
*Configurable to 1TB or 2TB SSD*

## Memory

- 16GB of 2133MHz LPDDR3 onboard memory

## Graphics

- **2.6GHz**  
Radeon Pro 450 with 2GB of GDDR5 memory and automatic graphics switching  
Intel HD Graphics 530  
*Configurable to Radeon Pro 460 with 4GB of GDDR5 memory and automatic graphics switching*
- **2.7GHz**  
Radeon Pro 455 with 2GB of GDDR5 memory and automatic graphics switching

# 749\_MacBook Pro (15-inch, 2016) - Technical Specifications.pdf

Intel HD Graphics 530

*Configurable to Radeon Pro 460 with 4GB of GDDR5 memory and automatic graphics switching*

## Charging and Expansion

Four Thunderbolt 3 (USB-C) ports with support for:

- Charging
- DisplayPort
- Thunderbolt (up to 40 Gbps)
- USB 3.1 Gen 2 (up to 10 Gbps)

## Keyboard and Trackpad

- **Full-size backlit keyboard with:**
  - 64 (U.S.) or 65 (ISO) keys including 4 arrow keys
  - Touch Bar with integrated Touch ID sensor
  - Ambient light sensor
  - Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Camera

- 720p FaceTime HD camera

## Video Support

Simultaneously supports full native resolution on the built-in display at millions of colors and:

- Up to two displays with 5120-by-2880 resolution at 60Hz at over a billion colors
- Up to four displays with 4096-by-2304 resolution at 60Hz at over a billion colors

Thunderbolt 3 digital video output

- Native DisplayPort output over USB-C
- VGA, HDMI, and Thunderbolt 2 output supported using adapters (sold separately)

## Audio

- Stereo speakers with high dynamic range
- Three microphones
- 3.5 mm headphone jack

## Battery and Power<sup>2</sup>

- Up to 10 hours wireless web
- Up to 10 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 76.0-watt-hour lithium-polymer battery
- 87W USB-C Power Adapter

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-24° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet

# 749\_MacBook Pro (15-inch, 2016) - Technical Specifications.pdf

- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and Weight

- Height: 0.61 inch (1.55 cm)
- Width: 13.75 inches (34.93 cm)
- Depth: 9.48 inches (24.07 cm)
- Weight: 4.02 pounds (1.83 kg)<sup>3</sup>

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.\*

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## What's in the Box

- 15-inch MacBook Pro
- 87W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Limited Warranty and Service

Every Mac comes with a [one-year limited warranty](#) and up to 90 days of [complimentary telephone technical support](#). Extend your coverage to three years from your Mac original purchase date with the AppleCare Protection Plan. You'll get direct, one-stop access to Apple's award-winning technical support for questions about your Mac, macOS, and Apple-branded applications such as Photos, iMovie, GarageBand, Pages, Numbers, Keynote, and more. In addition, you'll get 24/7 priority access to Apple experts via chat or phone through [getsupport.apple.com](#). You can even get local repair service when you visit other countries around the world.

## Configure to Order

Configure your MacBook Pro with these options, only at [apple.com](#):

- 2.9GHz quad-core Intel Core i7, Turbo Boost up to 3.8GHz, with 8MB shared L3 cache
- Radeon Pro 460 with 4GB of GDDR5 memory and automatic graphics switching
- 512GB, 1TB, or 2TB PCIe-based onboard SSD

## MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Pro is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

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[Learn more about how to recycle your Mac](#)

## Accessories

### Mac Software

- Final Cut Pro X
- Logic Pro X

### Displays and Adapters

- LG UltraFine 4K Display
- LG UltraFine 5K Display
- Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter
- USB-C to USB Adapter
- USB-C Digital AV Multiport Adapter
- USB-C VGA Multiport Adapter
- USB-C to Gigabit Ethernet Adapter

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

### Other Accessories

- USB-C to Lightning Cable
- USB-C Charge Cable
- 87W USB-C Power Adapter

- Magic Keyboard
- Magic Keyboard with Numeric Keypad
- Magic Trackpad 2
- Magic Mouse 2

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.70 ( $K_v = 0.25$ )	9.0
Wireless web	1.70 ( $K_v = 0.25$ )	9.0

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.05 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 0.5 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.7GHz quad-core Intel Core i7 processor, 16GB memory, 512GB storage, Radeon Pro 455 with 2GB of GDDR5 memory and automatic graphics switching Intel HD Graphics 530.

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\* Some features will be available on September 25, 2017, with macOS High Sierra.

1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
2. Testing conducted by Apple in October 2016 using preproduction 2.6GHz quad-core Intel Core i7-based 15-inch MacBook Pro systems with a 256GB SSD and 16GB of RAM. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
3. Weight varies by configuration and manufacturing process.
4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
5. PVC-free AC power cord available in all regions except India and South Korea.
6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Sep 26, 2017

# eMac - Technical Specifications

This article has been archived and is no longer updated by Apple.

## eMac - Technical Specifications

Configurations	
Order no.	M8577LL/A
Processor	700MHz PowerPC G4
Memory	128MB
Hard drive <sup>3</sup>	40GB Ultra ATA
Optical drive	CD-RW
Graphics support	NVIDIA GeForce2 MX with 32MB of DDR SDRAM
FireWire	Two ports
USB	Five ports
VGA video mirroring	Yes
Modem <sup>1</sup>	56K
Ethernet	10/100BASE-T
Wireless networking <sup>4</sup> AirPort ready	
Includes Apple Pro Keyboard; Apple Pro Mouse; Mac OS X v10.1, Mac OS 9.2, QuickTime, iMovie 2, iPhoto, iTunes 2, AppleWorks, Mac OS X Mail, Microsoft Internet Explorer, EarthLink, AOL, Quicken 2002 Deluxe, World Book Mac OS X Edition, Mac OS X Chess, Otto Matic, Deimos Rising, PCalc, Acrobat Reader, and FAXstf 10.0 Preview; Apple Hardware Test CD; complete setup, learning, and reference documentation; limited warranty; and 30 days of free Internet service through EarthLink.	

Internet access requires an Internet service account; fees may apply. Product contains electronic documentation. Backup copy of software is provided on CD-ROM.

Options	
Product	Order no.
eMac Tilt and Swivel Stand	eMac Tilt and Swivel Stand M8784G/A
Apple FireWire Cable (4-pin to 6-pin)	M8494G/A
AirPort Card	M7600LL/D
AirPort Base Station	M8209LL/A
iPod (5GB)	M8513LL/A
iPod (10GB)	M8709LL/A
AppleCare Protection Plan	M7812LL/B

## Technical Specifications

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## Processor and memory

- 700MHz PowerPC G4 processor with Velocity Engine
- 256K on-chip level 2 cache at full processor speed
- 100MHz system bus
- 128MB of SDRAM; two 168-pin DIMM slots support up to 1GB using 128MB, 256MB, or 512MB DIMMs

## Storage

- 40GB Ultra ATA hard disk drive<sup>3</sup>
- 24x10x32x-speed (maximum) CD-RW drive
- Support for external FireWire and USB storage devices

## Display

- Built-in 17-inch flat CRT (16-inch diagonal viewable image size); 0.25-mm dot pitch
- Onscreen geometry adjustment to keep display images properly aligned throughout the computer's lifetime

## Graphics support

- Five screen resolutions: 640 by 480 pixels at 138Hz, 800 by 600 pixels at 112Hz, 1024 by 768 pixels at 89Hz, 1152 by 864 pixels at 80Hz, and 1280 by 960 pixels at 72Hz
- NVIDIA GeForce2 MX graphics processor with AGP 2X support
- 32MB of dedicated Double Data Rate (DDR) SDRAM video memory

## Communications

- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in 56K V.90 modem (RJ-11 connector)<sup>1</sup>
- Built-in antennas and card slot for optional 11-Mbps AirPort Card; IEEE 802.11b compliant<sup>4</sup>

## Peripheral connections

- Two 400-Mbps FireWire (IEEE 1394) ports<sup>5</sup>; 8 watts shared
- Total of five USB 1.1 ports: three on computer (shared on two 12-Mbps controllers); two on keyboard

## Audio

- Integrated high-performance stereo audio system
- Internal 16-watt digital amplifier
- Built-in microphone for speech recognition and audio recording
- Headphone jack (headphones not included)
- Analog audio input minijack; up to 16-bit stereo and 44.1kHz sampling rate
- Support for external USB audio devices

## Video

- Mini-VGA output port (requires VGA display adapter)
- Support for video mirroring: external devices display an image identical to that shown on the built-in display

## Keyboard and mouse

- Apple Pro Keyboard with full-size function and navigation keys, audio controls, and media-eject key
- Apple Pro Mouse with optical sensor for maintenance-free use and precise cursor control

## Electrical requirements and agency approvals

- Line voltage: 100V AC or 220V AC depending on country of use
- Frequency: 47Hz to 63Hz, single phase
- Maximum continuous power: 170W
- Meets ENERGY STAR and TCO 95 requirements

## Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Size and weight

- Height: 15.8 inches (40.6 cm)
- Width: 15.8 inches (40.6 cm)
- Depth: 17.1 inches (43.3 cm)
- Weight: 50 pounds (22.7 kg)

- 
1. Actual modem speeds lower; speed depends on connection rate and other factors.
  2. iTunes is for legal or rightholder-authorized copying only. Don't steal music.
  3. 1GB = 1 billion bytes; actual formatted capacity less.
  4. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.
  5. Actual rates will vary.



# AirPods - Technical Specifications

## AirPods

### Overview

#### Wireless. Effortless. Magical.

AirPods will forever change the way you use headphones. Whenever you pull your AirPods out of the charging case, they instantly turn on and connect to your iPhone, Apple Watch, iPad, or Mac.<sup>1</sup> Audio automatically plays as soon as you put them in your ears and pauses when you take them out. To adjust the volume, change the song, make a call, or even get directions, just double-tap to activate Siri.

Driven by the custom Apple W1 chip, AirPods use optical sensors and a motion accelerometer to detect when they're in your ears. Whether you're using both AirPods or just one, the W1 chip automatically routes the audio and engages the microphone. And when you're on a call or talking to Siri, an additional accelerometer works with beamforming microphones to filter out background noise and focus on the sound of your voice. Because the ultralow-power W1 chip manages battery life so well, AirPods deliver an industry-leading 5 hours of listening time on one charge.<sup>2</sup> And they're made to keep up with you, thanks to a charging case that holds multiple additional charges for more than 24 hours of listening time.<sup>3</sup> Need a quick charge? Just 15 minutes in the case gives you 3 hours of listening time.<sup>4</sup>

### Highlights

- Designed by Apple
- Automatically on, automatically connected
- One-tap setup for all your Apple devices<sup>1</sup>
- Quick access to Siri with a double-tap
- More than 24-hour battery life with Charging Case<sup>3</sup>
- Charges quickly in the case
- Rich, high-quality audio and voice
- Seamless switching between devices

### What's in the Box

- AirPods
- Charging Case
- Lightning to USB Cable

### Weight

- AirPods (each): 0.14 ounces (4 g)
- Charging Case: 1.34 ounces (38 g)

### Dimensions

- AirPods (each): 0.65 by 0.71 by 1.59 inches (16.5 by 18.0 by 40.5 mm)
- Charging Case: 1.74 by 0.84 by 2.11 inches (44.3 by 21.3 by 53.5 mm)

### Connections

- AirPods: Bluetooth
- Charging Case: Lightning connector

### AirPods Sensors (each):

- Dual beam-forming microphones
- Dual optical sensors

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- Motion-detecting accelerometer
- Speech-detecting accelerometer

## Power and Battery

- AirPods with Charging Case: More than 24 hours listening time,<sup>3</sup> up to 11 hours talk time<sup>6</sup>
- AirPods (single charge): Up to 5 hours listening time,<sup>2</sup> Up to 2 hours talk time<sup>5</sup>
- 15 minutes in the case equals 3 hours listening time<sup>4</sup> or over an hour of talk time<sup>7</sup>

## System Requirements

- iPhone, iPad and iPod touch models with iOS 10 or later
- Apple Watch models with watchOS 3 or later
- Mac models with macOS Sierra or later

## Compatibility

### iPhone Models

- iPhone X
- iPhone 8
- iPhone 8 Plus
- iPhone 7
- iPhone 7 Plus
- iPhone 6s
- iPhone 6s Plus
- iPhone 6
- iPhone 6 Plus
- iPhone SE
- iPhone 5s
- iPhone 5c
- iPhone 5

### iPad Models

- iPad Pro 10.5-inch
- iPad Pro 12.9-inch (2nd Generation)
- iPad Pro 12.9-inch (1st Generation)
- iPad Pro 9.7-inch
- iPad
- iPad mini 4
- iPad mini 3
- iPad mini 2
- iPad Air 2
- iPad Air

### iPod Models

- iPod touch 6th Generation

### Watch Models

- 38mm Case
- 42mm Case

### Apple TV Models

- Apple TV 4K
- Apple TV (4th generation)

- 
1. Requires an iCloud account and macOS Sierra, iOS 10, or watchOS 3.
  2. Testing conducted by Apple in August 2016 using preproduction AirPods units and software paired with preproduction iPhone 7 units and software. The playlist consisted of 358 unique audio tracks purchased from the iTunes Store (256-Kbps AAC encoding). Volume was set to 50%. Testing consisted of full AirPods battery discharge while playing audio until the first AirPods stopped playback. Battery life depends on device settings, usage, and many other factors.
  3. Testing conducted by Apple in August 2016 using preproduction AirPods units and software paired with preproduction iPhone 7 units and

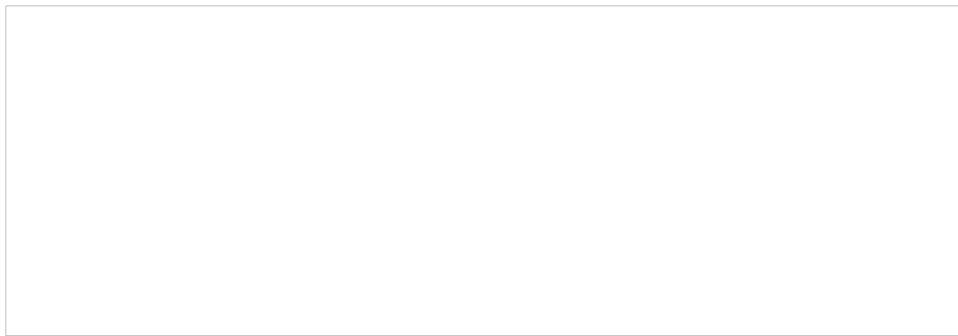
## 750\_AirPods - Technical Specifications.pdf

software. The playlist consisted of 358 unique audio tracks purchased from the iTunes Store (256-Kbps AAC encoding). Volume was set to 50%. Testing consisted of full AirPods battery discharge while playing audio until the first AirPods stopped playback. The drained AirPods were charged for 30 minutes, then audio playback was continued until the first AirPods stopped playback. This cycle was repeated until both the AirPods and the Charging Case were fully discharged. Battery life depends on device settings, usage, and many other factors.

4. Testing conducted by Apple in August 2016 using preproduction AirPods units and software paired with preproduction iPhone 7 units and software. The playlist consisted of 358 unique audio tracks purchased from the iTunes Store (256-Kbps AAC encoding). Volume was set to 50%. 15-Minute charge testing was conducted with drained AirPods that were charged for 15 minutes, then audio was played until the first AirPods stopped playback. Battery life depends on device settings, usage, and many other factors.
5. Testing conducted by Apple in August 2016 using preproduction AirPods units and software paired with preproduction iPhone 7 units and software. Volume was set to 50%. Testing consisted of full AirPods battery discharge with a cellular phone call until the first AirPods stopped playing call audio. Battery life depends on device settings, usage, and many other factors.
6. Testing conducted by Apple in August 2016 using preproduction AirPods units and software paired with preproduction iPhone 7 units and software. Volume was set to 50%. Testing consisted of full AirPods battery discharge with a cellular phone call until the first AirPods stopped playing call audio. The drained AirPods were charged for 30 minutes, then the cellular phone call was continued until the first AirPods stopped playing call audio. This cycle was repeated until both the AirPods and the Charging Case were fully discharged. Battery life depends on device settings, usage, and many other factors.
7. Testing conducted by Apple in August 2016 using preproduction AirPods units and software paired with preproduction iPhone 7 units and software. Volume was set to 50%. 15-Minute charge testing was conducted with drained AirPods that were charged for 15 minutes, then a cellular phone call was conducted until the first AirPods stopped playing call audio. Battery life depends on device settings, usage, and many other factors.

Published Date: Mar 19, 2018

# iPad (5th generation) - Technical Specifications



## Finish

- Silver
- Gold
- Space Gray

## Capacity<sup>1</sup>

- Wi-Fi
  - 32GB
  - 128GB
- Wi-Fi + Cellular
  - 32GB
  - 128GB

## Size and Weight<sup>2</sup>

- Wi-Fi
  - Height: 9.4 inches (240 mm)
  - Width: 6.6 inches (169.5 mm)
  - Depth: 0.29 inch (7.5 mm)
  - Weight: 1.03 pounds (469 g)
- Wi-Fi + Cellular
  - Height: 9.4 inches (240 mm)
  - Width: 6.6 inches (169.5 mm)
  - Depth: 0.29 inch (7.5 mm)
  - Weight: 1.05 pounds (478 g)

## Buttons and Connectors

- Home/Touch ID sensor
- Built-in stereo speakers
- Lightning connector
- 3.5 mm headphone jack
- On/Off - Sleep/Wake
- Volume up/down
- Nano-SIM tray (cellular models)

## Connector

- Lightning

## In the Box

- iPad
- Lightning to USB Cable
- USB Power Adapter

## Display

# 751\_iPad (5th generation) - Technical Specifications.pdf

- Retina display
- 9.7-inch (diagonal) LED-backlit Multi-Touch display with IPS technology
- 2048-by-1536-pixel resolution at 264 ppi
- Fingerprint-resistant oleophobic coating

## Chip

- A9 chip with 64-bit architecture
- Embedded M9 coprocessor

## Camera

- 8-megapixel camera
- Live Photos
- Autofocus
- Panorama (up to 43 megapixels)
- HDR for photos
- Exposure control
- Burst mode
- Tap to focus
- Timer mode
- $f/2.4$  aperture
- Five-element lens
- Hybrid IR filter
- Backside illumination
- Auto image stabilization
- Face detection
- Photo geotagging

## Video Recording

- 1080p HD video recording (30 fps)
- Slo-mo (120 fps)
- Time-lapse video with stabilization
- Video image stabilization
- Face detection
- 3x video zoom
- Video geotagging

## FaceTime HD Camera

- 1.2-megapixel photos
- Live Photos
- $f/2.2$  aperture
- Retina Flash
- 720p HD video recording
- Backside illumination
- HDR for photos and videos
- Face detection
- Burst mode
- Exposure control
- Timer mode

## Video Calling<sup>3</sup>

- Wi-Fi
  - FaceTime video
  - iPad to any FaceTime-enabled device over Wi-Fi
- Wi-Fi + Cellular
  - FaceTime video
  - iPad to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Calling<sup>3</sup>

- Wi-Fi

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- FaceTime audio
- iPad to any FaceTime-enabled device over Wi-Fi
- Wi-Fi + Cellular
  - FaceTime audio
  - iPad to any FaceTime-enabled device over Wi-Fi or cellular

## Cellular and Wireless

- **Wi-Fi model**  
Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO  
Bluetooth 4.2 technology
- **Wi-Fi + Cellular model**  
Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO  
Bluetooth 4.2 technology  
UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)  
CDMA EV-DO Rev. A and Rev. B (800, 1900 MHz)  
LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28, 29, 38, 39, 40, 41)<sup>4</sup>  
Data only<sup>5</sup>  
Wi-Fi calling<sup>4</sup>  
Includes Apple SIM  
[Learn more about Apple SIM](#)

## SIM Card

- Nano-SIM (supports Apple SIM)

## Location

- Wi-Fi
  - Digital compass
  - Wi-Fi
  - iBeacon microlocation
- Wi-Fi + Cellular model
  - Digital compass
  - Wi-Fi
  - Assisted GPS and GLONASS
  - Cellular
  - iBeacon microlocation

## Sensors

- Touch ID
- Three-axis gyro
- Accelerometer
- Barometer
- Ambient light sensor

## Touch ID

- Fingerprint identity sensor built into the Home button

## Apple Pay

- Pay with your iPad using Touch ID within apps and on the web
- Send and receive money in Messages

[Learn more about Apple Pay](#)

## Siri<sup>6</sup>

- Use your voice to send messages, set reminders, and more
- Use hands-free
- Listen and identify songs

[Learn more about Siri](#)

# 751\_iPad (5th generation) - Technical Specifications.pdf

## Power and Battery<sup>7</sup>

- Wi-Fi
  - Built-in 32.4-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- Wi-Fi + Cellular model
  - Built-in 32.4-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Up to 9 hours of surfing the web using cellular data network
  - Charging via power adapter or USB to computer system

## Operating System

### iOS 11

With new features and capabilities that let you get more done quickly and easily, iOS 11 makes iPad more powerful, personal, and intelligent than ever.

[See what's new in iOS 11](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPad. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Siri and Dictation
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- Contacts
- iBooks
- Home
- Reminders
- Clock
- TV
- News
- Photo Booth
- Podcasts
- Find My iPhone
- Find My Friends
- Files

## Free Apps from Apple<sup>8</sup>

# 751\_iPad (5th generation) - Technical Specifications.pdf

*Pages, Numbers, Keynote, iMovie, GarageBand, and iTunes U are preinstalled on iPad.*

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Apple Store
- Trailers
- Remote
- Music Memos
- Clips
- Swift Playgrounds

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>9</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X 10.9.5 or later
- PC: Windows 7 or later
- iTunes 12.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Languages

### • Language support

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • QuickType keyboard support

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

### • QuickType keyboard support with predictive input

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

### • Siri languages

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

### • Dictation languages

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • Definition dictionary support

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

### • Bilingual dictionary support

Chinese (Simplified), Dutch, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish



# 751\_iPad (5th generation) - Technical Specifications.pdf

- **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## Audio Playback

- Frequency response: 20Hz to 20,000Hz
- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- **Viewable document types**

.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## Environmental Requirements

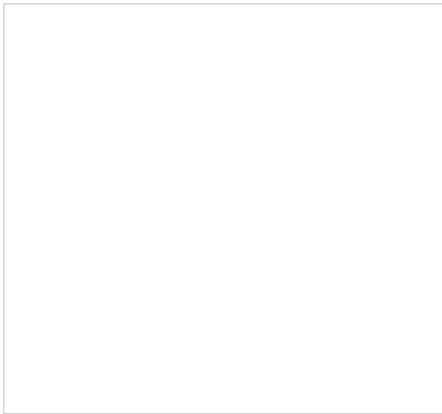
- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

- 
1. Available space is less and varies due to many factors. A standard configuration uses approximately 8GB to 11GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
  2. Size and weight vary by configuration and manufacturing process.
  3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
  4. Data plan required. LTE and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).
  5. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
  6. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
  7. Testing conducted by Apple in February 2017 using preproduction iPad (9.7-inch) units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.
  8. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the App Store. Downloading apps requires an Apple ID and a device that is compatible with the iOS version required for each app.
  9. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: May 17, 2018

# MacBook Air (13-inch, 2017) - Technical Specifications



## Display

- 13.3-inch (diagonal) LED-backlit glossy widescreen display with support for millions of colors
- Supported resolutions: 1440 by 900 (native), 1280 by 800, 1152 by 720, and 1024 by 640 pixels at 16:10 aspect ratio and 1024 by 768 and 800 by 600 pixels at 4:3 aspect ratio

## Storage<sup>1</sup>

- **128GB**  
128GB PCIe-based SSD  
*Configurable to 256GB or 512GB SSD*
- **256GB**  
256GB PCIe-based SSD  
*Configurable to 512GB SSD*

## Processor

- 1.8GHz dual-core Intel Core i5, Turbo Boost up to 2.9GHz, with 3MB shared L3 cache  
*Configurable to 2.2GHz dual-core Intel Core i7, Turbo Boost up to 3.2GHz, with 4MB shared L3 cache*

## Memory

- 8GB of 1600MHz LPDDR3 onboard memory

## Battery and Power<sup>2</sup>

- Up to 12 hours wireless web
- Up to 12 hours iTunes movie playback
- Up to 30 days standby time
- Built-in 54-watt-hour lithium-polymer battery
- 45W MagSafe 2 Power Adapter with cable management; MagSafe 2 power port

## Size and Weight

- **Height:** 0.11–0.68 inch (0.3–1.7 cm)
- **Width:** 12.8 inches (32.5 cm)
- **Depth:** 8.94 inches (22.7 cm)
- **Weight:** 2.96 pounds (1.35 kg)<sup>3</sup>

## Graphics and Video Support

- Intel HD Graphics 6000
  - Dual display and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 3840-by-2160 resolution at 60Hz on an external display, both at millions of colors.
- Thunderbolt digital video output
  - Native Mini DisplayPort output
  - DVI output using Mini DisplayPort to DVI Adapter (sold separately)
  - VGA output using Mini DisplayPort to VGA Adapter (sold separately)

# 753\_MacBook Air (13-inch, 2017) - Technical Specifications.pdf

- Dual-link DVI output using Mini DisplayPort to Dual-Link DVI Adapter (sold separately)
- HDMI audio and video output using third-party Mini DisplayPort to HDMI Adapter (sold separately)

## Camera

- 720p FaceTime HD camera

## Charging and Expansion

- Two USB 3 ports (up to 5 Gbps)
- Thunderbolt 2 port (up to 20 Gbps)
- MagSafe 2 power port
- SDXC card slot
- 3.5 mm headphone jack

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.0 wireless technology

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack

## Keyboard and Trackpad

Full-size backlit keyboard with:

- 78 (U.S.) or 79 (ISO) keys, including 12 function keys and 4 arrow keys (inverted “T” arrangement)
- Ambient light sensor
- Multi-Touch trackpad for precise cursor control; supports inertial scrolling, pinch, rotate, swipe, three-finger swipe, four-finger swipe, tap, double-tap, and drag capabilities

## Electrical and Operating Requirements

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Air. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Reduce Motion
- Closed Captions
- Zoom

# 753\_MacBook Air (13-inch, 2017) - Technical Specifications.pdf

- Siri and Dictation
- Text to Speech
- Increase Contrast
- Switch Control

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## In the Box

- MacBook Air
- Power adapter
- AC wall plug
- Power cord

## Configure to Order

Configure your MacBook Air to order with these options, only at [www.apple.com](http://www.apple.com):

- 2.2GHz dual-core Intel Core i7, Turbo Boost up to 3.2GHz, with 4MB L3 cache
- 256GB or 512GB PCIe-based SSD

## MacBook Air and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Air is designed with the following features to reduce environmental impact:

- BFR-free
- PVC-free<sup>5</sup>
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

## Acoustic Performance

# 753\_MacBook Air (13-inch, 2017) - Technical Specifications.pdf

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.3 ( $K_v = 0.3$ )	4
Wireless web	1.3 ( $K_v = 0.3$ )	4

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 1.8GHz dual-core Intel Core i5 processor, 8GB memory, 256GB storage, Intel HD Graphics 6000.

## Accessories

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

### Mac Software

- Logic Pro X
- Final Cut Pro X

### Adapters

- Apple Mini DisplayPort to DVI Adapter
- Apple Mini DisplayPort to VGA Adapter
- Apple Mini DisplayPort to Dual-Link DVI Adapter
- MagSafe to MagSafe 2 Converter

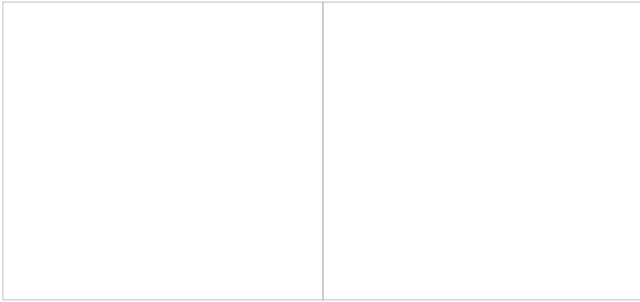
### Other Accessories

- Apple USB SuperDrive
- Thunderbolt to Gigabit Ethernet Adapter
- Thunderbolt to FireWire Adapter
- 45W MagSafe 2 Power Adapter
- AppleCare+ for Mac

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Testing conducted by Apple in May 2017 using preproduction 1.8GHz dual-core Intel Core i5-based 13-inch MacBook Air systems with a 256GB SSD and 8GB of RAM. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  3. Weight varies by configuration and manufacturing process.
  4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  5. PVC-free AC power cord available in all regions except India and South Korea.
  6. MacBook Air achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Apr 23, 2018

# MacBook Pro (13-inch, 2017, Two Thunderbolt 3 Ports) - Technical Specifications



## Finish

- Silver
- Space Gray

## Display

- Retina display
- 13.3-inch (diagonal) LED-backlit display with IPS technology; 2560-by-1600 native resolution at 227 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 1680 by 1050
  - 1440 by 900
  - 1024 by 640
- 500 nits brightness
- Wide color (P3)

## Processor

- 2.3GHz dual-core Intel Core i5, Turbo Boost up to 3.6GHz, with 64MB of eDRAM  
*Configurable to 2.5GHz dual-core Intel Core i7, Turbo Boost up to 4.0GHz, with 64MB of eDRAM*

## Storage<sup>1</sup>

- **128GB**  
128GB PCIe-based onboard SSD  
*Configurable to 256GB, 512GB, or 1TB SSD*
- **256GB**  
256GB PCIe-based onboard SSD  
*Configurable to 512GB or 1TB SSD*

## Memory

- 8GB of 2133MHz LPDDR3 onboard memory  
*Configurable to 16GB of memory*

## Graphics

- Intel Iris Plus Graphics 640

## Charging and Expansion

Two Thunderbolt 3 (USB-C) ports with support for:

- Charging
- DisplayPort
- Thunderbolt (up to 40 Gbps)
- USB 3.1 Gen 2 (up to 10 Gbps)

## Keyboard and Trackpad

# 754\_MacBook Pro (13-inch, 2017, Two Thunderbolt 3 Ports) - Technical Specifications.pdf

- **Full-size backlit keyboard with:**
  - 78 (U.S.) or 79 (ISO) keys including 12 function keys and 4 arrow keys
  - Ambient light sensor
  - Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Camera

- 720p FaceTime HD camera

## Video Support

Simultaneously supports full native resolution on the built-in display at millions of colors and:

- One display with 5120-by-2880 resolution at 60Hz at over a billion colors
- Up to two displays with 4096-by-2304 resolution at 60Hz at millions of colors
- Up to two displays with 3840-by-2160 resolution at 60Hz at over a billion colors

Thunderbolt 3 digital video output

- Native DisplayPort output over USB-C
- VGA, HDMI, DVI, and Thunderbolt 2 output supported using adapters (sold separately)

## Audio

- Stereo speakers with high dynamic range
- Two microphones
- 3.5 mm headphone jack

## Battery and Power<sup>2</sup>

- Up to 10 hours wireless web
- Up to 10 hours iTunes movie playback
- Up to 30 days of standby time
- Built-in 54.5-watt-hour lithium-polymer battery
- 61W USB-C Power Adapter

## Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and Weight

- Height: 0.59 inch (1.49 cm)
- Width: 11.97 inches (30.41 cm)
- Depth: 8.36 inches (21.24 cm)
- Weight: 3.02 pounds (1.37 kg)<sup>3</sup>

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and

# 754\_MacBook Pro (13-inch, 2017, Two Thunderbolt 3 Ports) - Technical Specifications.pdf

enhanced features to your Mac. It's macOS at its highest level yet.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## What's in the Box

- 13-inch MacBook Pro
- 61W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Configure to Order

Configure your MacBook Pro with these options, only at [apple.com](https://apple.com):

- 2.5GHz dual-core Intel Core i7, Turbo Boost up to 4.0GHz, with 64MB of eDRAM
- 16GB of 2133MHz LPDDR3 memory
- 256GB, 512GB, or 1TB SSD

## MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Pro is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display



- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR requirements
- Rated EPEAT Gold<sup>6</sup>

Apple and the Environment

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Apple GiveBack

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[See how it works](#)

Accessories

Mac Software

- Final Cut Pro X
- Logic Pro X

Displays and Adapters

- LG UltraFine 4K Display
- LG UltraFine 5K Display
- Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter
- USB-C to USB Adapter
- USB-C Digital AV Multiport Adapter
- USB-C VGA Multiport Adapter
- USB-C to Gigabit Ethernet Adapter

Other Accessories

- USB-C to Lightning Cable
- USB-C Charge Cable
- 61W USB-C Power Adapter
- Magic Keyboard
- Magic Keyboard with Numeric Keypad
- Magic Trackpad 2
- Magic Mouse 2
- AppleCare+ for Mac

Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.2 ( $K_v=0.3$ )	3
Wireless web	1.3 ( $K_v=0.3$ )	3

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.3GHz dual-core Intel Core i5 processor, 8GB memory, 256GB storage, Intel Iris Plus Graphics 640.

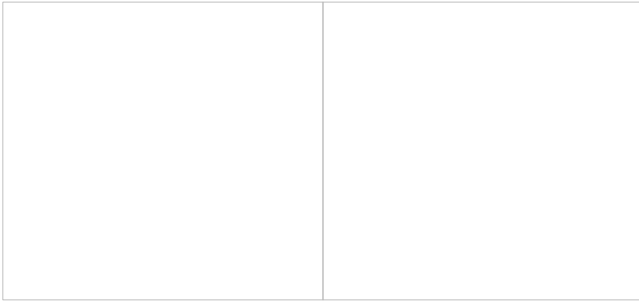
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.

## 754\_MacBook Pro (13-inch, 2017, Two Thunderbolt 3 Ports) - Technical Specifications.pdf

2. Testing conducted by Apple in June 2018 using preproduction 2.3GHz quad-core Intel Core i5-based 13-inch MacBook Pro systems with 8GB of RAM and 512GB SSD; and preproduction 2.6GHz 6-core Intel Core i7-based 15-inch MacBook Pro systems with 16GB of RAM and 512GB SSD. Testing conducted by Apple in May 2017 using preproduction 2.3GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with 8GB of RAM and 1TB SSD. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
3. Weight varies by configuration and manufacturing process.
4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
5. PVC-free AC power cord available in all regions except India and South Korea.
6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Sep 12, 2018

# MacBook Pro (13-inch, 2017, Four Thunderbolt 3 Ports) - Technical Specifications



## Touch Bar

- Touch Bar with integrated Touch ID sensor

## Finish

- Silver
- Space Gray

## Display

- Retina display
- 13.3-inch (diagonal) LED-backlit display with IPS technology; 2560-by-1600 native resolution at 227 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 1680 by 1050
  - 1440 by 900
  - 1024 by 640
- 500 nits brightness
- Wide color (P3)

## Processor

- 3.1GHz dual-core Intel Core i5, Turbo Boost up to 3.5GHz, with 64MB of eDRAM  
*Configurable to 3.3GHz dual-core Intel Core i5, Turbo Boost up to 3.7GHz, with 64MB of eDRAM; or 3.5GHz dual-core Intel Core i7, Turbo Boost up to 4.0GHz, with 64MB of eDRAM*

## Storage<sup>1</sup>

- **256GB**  
256GB PCIe-based onboard SSD  
*Configurable to 512GB or 1TB SSD*
- **512GB**  
512GB PCIe-based onboard SSD  
*Configurable to 1TB SSD*

## Memory

- 8GB of 2133MHz LPDDR3 onboard memory  
*Configurable to 16GB of memory*

## Graphics

- Intel Iris Plus Graphics 650

## Charging and Expansion

Four Thunderbolt 3 (USB-C) ports with support for:

- Charging

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- DisplayPort
- Thunderbolt (up to 40 Gbps)
- USB 3.1 Gen 2 (up to 10 Gbps)

## Keyboard and Trackpad

- **Full-size backlit keyboard with:**
  - 64 (U.S.) or 65 (ISO) keys including 4 arrow keys
  - Touch Bar with integrated Touch ID sensor
  - Ambient light sensor
  - Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Camera

- 720p FaceTime HD camera

## Video Support

Simultaneously supports full native resolution on the built-in display at millions of colors and:

- One display with 5120-by-2880 resolution at 60Hz at over a billion colors
- Up to two displays with 4096-by-2304 resolution at 60Hz at millions of colors
- Up to two displays with 3840-by-2160 resolution at 60Hz at over a billion colors

Thunderbolt 3 digital video output

- Native DisplayPort output over USB-C
- VGA, HDMI, and Thunderbolt 2 output supported using adapters (sold separately)

## Audio

- Stereo speakers with high dynamic range
- Three microphones
- 3.5 mm headphone jack

## Battery and Power<sup>2</sup>

- Up to 10 hours wireless web
- Up to 10 hours iTunes movie playback
- Up to 30 days of standby time
- Built-in 49.2-watt-hour lithium-polymer battery
- 61W USB-C Power Adapter

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and Weight

- Height: 0.59 inch (1.49 cm)
- Width: 11.97 inches (30.41 cm)

# 755\_MacBook Pro (13-inch, 2017, Four Thunderbolt 3 Ports) - Technical Specifications.pdf

- Depth: 8.36 inches (21.24 cm)
- Weight: 3.02 pounds (1.37 kg)<sup>3</sup>

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## What's in the Box

- 13-inch MacBook Pro
- 61W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Configure to Order

Configure your MacBook Pro with these options, only at [apple.com](https://apple.com):

- 3.3GHz dual-core Intel Core i5, Turbo Boost up to 3.7GHz, with 64MB of eDRAM; or 3.5GHz dual-core Intel Core i7, Turbo Boost up to 4.0GHz, with 64MB of eDRAM
- 16GB of 2133MHz LPDDR3 onboard memory

- 512GB or 1TB PCIe-based onboard SSD

MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Pro is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

Apple and the Environment

[Learn more](#) about Apple’s dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it’s in good shape, you can trade it in for Apple Store credit. If it’s not eligible for credit, we’ll recycle it responsibly at no cost to you. Good for you. Good for the planet. [See how it works](#)

Accessories

Mac Software

- Final Cut Pro X
- Logic Pro X

Displays and Adapters

- LG UltraFine 4K Display
- LG UltraFine 5K Display
- Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter
- USB-C to USB Adapter
- USB-C Digital AV Multiport Adapter
- USB-C VGA Multiport Adapter
- USB-C to Gigabit Ethernet Adapter

AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

Other Accessories

- USB-C to Lightning Cable
- USB-C Charge Cable
- 61W USB-C Power Adapter
- Magic Keyboard
- Magic Keyboard with Numeric Keypad
- Magic Trackpad 2
- Magic Mouse 2
- AppleCare+ for Mac

Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	<b>Sound Power Level</b> <i>L<sub>W A,m</sub></i> (B)	<b>Sound Pressure Level</b> <b>Operator Position</b> <i>L<sub>p A,m</sub></i> (dB)
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	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.3 ( $K_v = 0.3$ )	3
Wireless web	1.3 ( $K_v = 0.3$ )	4

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WAd}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 3.1GHz dual-core Intel Core i5, 8GB memory, 512GB storage, Intel Iris Plus Graphics 650.

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Testing conducted by Apple in May 2017 using preproduction 2.3GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with a 1TB SSD and 8GB of RAM; and preproduction 3.1GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with a 512GB SSD and 8GB of RAM. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  3. Weight varies by configuration and manufacturing process.
  4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  5. PVC-free AC power cord available in all regions except India and South Korea.
  6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Apr 23, 2018

# MacBook Pro (15-inch, 2017) - Technical Specifications



## Touch Bar

- Touch Bar with integrated Touch ID sensor

## Finish

- Silver
- Space Gray

## Display

- Retina display
- 15.4-inch (diagonal) LED-backlit display with IPS technology; 2880-by-1800 native resolution at 220 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 1920 by 1200
  - 1680 by 1050
  - 1280 by 800
  - 1024 by 640
- 500 nits brightness
- Wide color (P3)

## Processor

- **2.8GHz**  
2.8GHz quad-core Intel Core i7, Turbo Boost up to 3.8GHz, with 6MB shared L3 cache  
*Configurable to 3.1GHz quad-core Intel Core i7, Turbo Boost up to 4.1GHz, with 8MB shared L3 cache*
- **2.9GHz**  
2.9GHz quad-core Intel Core i7, Turbo Boost up to 3.9GHz, with 8MB shared L3 cache  
*Configurable to 3.1GHz quad-core Intel Core i7, Turbo Boost up to 4.1GHz, with 8MB shared L3 cache*

## Storage<sup>1</sup>

- **256GB**  
256GB PCIe-based onboard SSD  
*Configurable to 512GB, 1TB, or 2TB SSD*
- **512GB**  
512GB PCIe-based onboard SSD  
*Configurable to 1TB or 2TB SSD*

## Memory

- 16GB of 2133MHz LPDDR3 onboard memory

## Graphics

- **2.8GHz**  
Radeon Pro 555 with 2GB of GDDR5 memory and automatic graphics switching  
Intel HD Graphics 630  
*Configurable to Radeon Pro 560 with 4GB of GDDR5 memory*
- **2.9GHz**  
Radeon Pro 560 with 4GB of GDDR5 memory and automatic graphics switching



Intel HD Graphics 630

## Charging and Expansion

Four Thunderbolt 3 (USB-C) ports with support for:

- Charging
- DisplayPort
- Thunderbolt (up to 40 Gbps)
- USB 3.1 Gen 2 (up to 10 Gbps)

## Keyboard and Trackpad

- **Full-size backlit keyboard with:**
  - 64 (U.S.) or 65 (ISO) keys including 4 arrow keys
  - Touch Bar with integrated Touch ID sensor
  - Ambient light sensor
  - Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Camera

- 720p FaceTime HD camera

## Video Support

Simultaneously supports full native resolution on the built-in display at millions of colors and:

- Up to two displays with 5120-by-2880 resolution at 60Hz at over a billion colors
- Up to four displays with 4096-by-2304 resolution at 60Hz at millions of colors
- Up to four displays with 3840-by-2160 resolution at 60Hz at over a billion colors

Thunderbolt 3 digital video output

- Native DisplayPort output over USB-C
- VGA, HDMI, and Thunderbolt 2 output supported using adapters (sold separately)

## Audio

- Stereo speakers with high dynamic range
- Three microphones
- 3.5 mm headphone jack

## Battery and Power<sup>2</sup>

- Up to 10 hours wireless web
- Up to 10 hours iTunes movie playback
- Up to 30 days of standby time
- Built-in 76.0-watt-hour lithium-polymer battery
- 87W USB-C Power Adapter

## Electrical and Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet

# 756\_MacBook Pro (15-inch, 2017) - Technical Specifications.pdf

- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and Weight

- Height: 0.61 inch (1.55 cm)
- Width: 13.75 inches (34.93 cm)
- Depth: 9.48 inches (24.07 cm)
- Weight: 4.02 pounds (1.83 kg)<sup>3</sup>

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## What's in the Box

- 15-inch MacBook Pro
- 87W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Configure to Order

Configure your MacBook Pro with these options, only at [apple.com](https://apple.com):

- 3.1GHz quad-core Intel Core i7, Turbo Boost up to 4.1GHz, with 8MB shared L3 cache
- Radeon Pro 560 with 4GB of GDDR5 memory
- 512GB, 1TB, or 2TB PCIe-based onboard SSD

## MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Pro is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

## Accessories

### Mac Software

- Final Cut Pro X
- Logic Pro X

### Displays and Adapters

- LG UltraFine 4K Display
- LG UltraFine 5K Display
- Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter
- USB-C to USB Adapter
- USB-C Digital AV Multiport Adapter
- USB-C VGA Multiport Adapter
- USB-C to Gigabit Ethernet Adapter

### AirPort and Wireless

- AirPort Express
- AirPort Extreme
- AirPort Time Capsule

### Other Accessories

- USB-C to Lightning Cable
- USB-C Charge Cable
- 87W USB-C Power Adapter
- Magic Keyboard
- Magic Keyboard with Numeric Keypad
- Magic Trackpad 2
- Magic Mouse 2
- AppleCare+ for Mac

## Acoustic Performance

# 756\_MacBook Pro (15-inch, 2017) - Technical Specifications.pdf

Declared noise emission values in accordance with ECMA-109

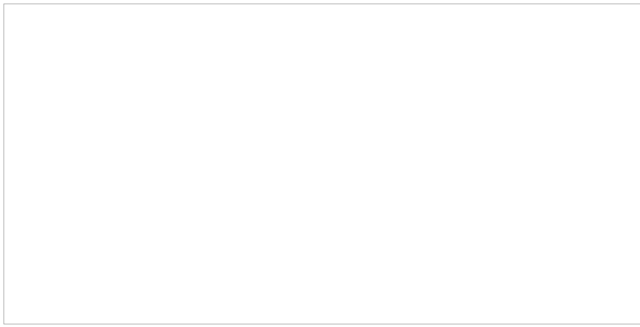
	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.7 ( $K_v=0.3$ )	9.0
Wireless web	1.7 ( $K_v=0.3$ )	9.0

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.9GHz quad-core Intel Core i7 processor, 16GB memory, 512GB storage, Radeon Pro 560 with 4GB GDDR5 memory.

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Testing conducted by Apple in May 2017 using preproduction 2.8GHz quad-core Intel Core i7-based 15-inch MacBook Pro systems with a 256GB SSD and 16GB of RAM. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  3. Weight varies by configuration and manufacturing process.
  4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  5. PVC-free AC power cord available in all regions except India and South Korea.
  6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Aug 6, 2018

# MacBook (Retina, 12-inch, 2017) - Technical Specifications



## Finish

- Rose Gold
- Space Gray
- Gold
- Silver

## Display

- Retina display
- 12-inch (diagonal) LED-backlit display with IPS technology
- 2304-by-1440 resolution at 226 pixels per inch with support for millions of colors
- 16:10 aspect ratio
- Supported scaled resolutions:
  - 1440 by 900
  - 1280 by 800
  - 1024 by 640

## Processor

- **1.2GHz**  
1.2GHz dual-core Intel Core m3, Turbo Boost up to 3.0GHz, with 4MB L3 cache  
*Configurable to 1.3GHz dual-core Intel Core i5, Turbo Boost up to 3.2GHz, with 4MB L3 cache; or 1.4GHz dual-core Intel Core i7, Turbo Boost up to 3.6GHz, with 4MB shared L3 cache*
- **1.3GHz**  
1.3GHz dual-core Intel Core i5, Turbo Boost up to 3.2GHz, with 4MB L3 cache  
*Configurable to 1.4GHz dual-core Intel Core i7, Turbo Boost up to 3.6GHz, with 4MB L3 cache*

## Memory

- 8GB of 1866MHz LPDDR3 onboard memory  
*Configurable to 16GB of memory*

## Storage

- **1.2GHz**  
256GB PCIe-based onboard SSD<sup>1</sup>
- **1.3GHz**  
512GB PCIe-based onboard SSD<sup>1</sup>

## Size and Weight

- **Height:** 0.14–0.52 inch (0.35–1.31 cm)
- **Width:** 11.04 inches (28.05 cm)
- **Depth:** 7.74 inches (19.65 cm)
- **Weight:** 2.03 pounds (0.92 kg)<sup>2</sup>

## Graphics and Video Support

- Intel HD Graphics 615
- Dual display and video mirroring: simultaneously supports full native resolution on the built-in display and up to 4096-by-2304 resolution at

# 757\_MacBook (Retina, 12-inch, 2017) - Technical Specifications.pdf

60Hz on an external display, both at millions of colors

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Charging and Expansion

- USB-C port with support for:
  - Charging
  - USB 3.1 Gen 1 (up to 5 Gbps)
  - Native DisplayPort 1.2 video output
  - VGA output using USB-C VGA Multiport Adapter (sold separately)
  - HDMI video output using USB-C Digital AV Multiport Adapter (sold separately)

## Camera

- 480p FaceTime camera

## Audio

- Stereo speakers
- Dual microphones
- 3.5 mm headphone jack

## Keyboard and Trackpad

- Full-size keyboard with:
- 78 (U.S.) or 79 (ISO) individual LED backlit keys, including 12 function keys and 4 arrow keys
- Ambient light sensor
- Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Battery and Power

- Up to 10 hours wireless web<sup>3</sup>
- Up to 12 hours iTunes movie playback<sup>3</sup>
- Up to 30 days of standby time<sup>3</sup>
- Built-in 41.4-watt-hour lithium-polymer battery
- 29W USB-C Power Adapter; USB-C power port

## Electrical and Operating Requirements

- Line voltage: 100V–240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet. [Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

**Built-in Apps<sup>4</sup>**

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

**Acoustic Performance**

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.2 ( $K_v=0.3$ )	3
Wireless web	1.2 ( $K_v=0.3$ )	3

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at the operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 1.4GHz dual-core Intel Core i7 processor, 16GB memory, 512GB storage, Intel HD Graphics 615.

**Accessories**

**Displays and Adapters**

- LG UltraFine 4K Display
- USB-C to USB Adapter
- USB-C Digital AV Multiport Adapter
- USB-C VGA Multiport Adapter
- Power Adapter Extension Cable

## AirPort and Wireless

- AirPort Extreme
- AirPort Express
- AirPort Time Capsule

## Other Accessories

- Magic Mouse 2
- Magic Trackpad 2
- Magic Keyboard
- Magic Keyboard with Numeric Keypad
- World Travel Adapter Kit
- USB-C to Lightning Cable
- USB-C Charge Cable
- 29W USB-C Power Adapter
- AppleCare+ for Mac

## In the Box

- MacBook
- 29W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Configure to Order

Configure your MacBook to order with these options, only at [apple.com](https://apple.com).

- **1.2GHz model**
  - 1.3GHz dual-core Intel Core i5, Turbo Boost up to 3.2GHz, with 4MB shared L3 cache; or 1.4GHz dual-core Intel Core i7, Turbo Boost up to 3.6GHz, with 4MB shared L3 cache
  - 16GB of 1866MHz LPDDR3 onboard memory
- **1.3GHz model**
  - 1.4GHz dual-core Intel Core i7, Turbo Boost up to 3.6GHz, with 4MB shared L3 cache
  - 16GB of 1866MHz LPDDR3 onboard memory

## MacBook and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook is designed with the following features to reduce its environmental impact:

- Mercury-free display
- Arsenic-free display glass
- BFR-free
- PVC-free
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR Version 6.1 requirements
- Rated EPEAT Gold<sup>5</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

- 
1. 1GB = 1 billion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. Testing conducted by Apple in March 2017 using preproduction 1.3GHz dual-core Intel Core i5-based 12-inch MacBook systems with a 512GB SSD and 8GB of RAM. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a



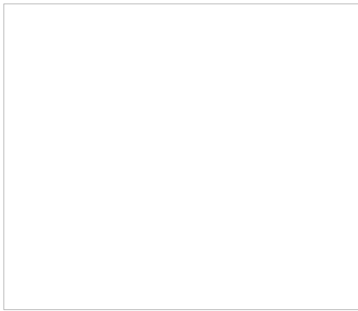
## 757\_MacBook (Retina, 12-inch, 2017) - Technical Specifications.pdf

wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
5. MacBook achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Apr 23, 2018

# iMac (21.5-inch, 2017) - Technical Specifications



## Display

- 21.5-inch (diagonal) LED-backlit display
- 1920-by-1080 resolution with support for millions of colors

## Processor

- **2.3GHz**  
2.3GHz dual-core Intel Core i5 (Turbo Boost up to 3.6GHz)

## Memory

- **2.3GHz**  
8GB of 2133MHz DDR4 memory  
*Configurable to 16GB*

## Storage<sup>1</sup>

- 1TB (5400-rpm) hard drive  
*Configurable to 1TB Fusion Drive or 256GB SSD*

## Graphics

- Intel Iris Plus Graphics 640

## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display at millions of colors (21.5-inch) or 1 billion colors (21.5-inch 4K) and:
  - One 5120-by-2880 (5K) external display at 60Hz with support for 1 billion colors, or
  - Two 3840-by-2160 (4K UHD) external displays at 60Hz with support for 1 billion colors, or
  - Two 4096-by-2304 (4K) external displays at 60Hz with support for millions of colors
- Thunderbolt 3 digital video output
- Native DisplayPort output over USB-C
- Thunderbolt 2, HDMI, DVI, and VGA output supported using adapters (sold separately)

## Audio

- Stereo speakers
- Microphone
- 3.5 mm headphone jack
  - Support for Apple iPhone headset with microphone

## Connections and Expansion

- 3.5 mm headphone jack
- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt 3 (USB-C) ports with support for:
  - DisplayPort
  - Thunderbolt (up to 40 Gbps)

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- USB 3.1 Gen 2 (up to 10 Gbps)
- Thunderbolt 2, HDMI, DVI, and VGA supported using adapters (sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Kensington lock slot

## Input

- **Magic Keyboard**

Magic Keyboard comes standard with your iMac. It's wireless and rechargeable (so you won't be replacing batteries), with an ultracompact, edge-to-edge design that wastes no surface space. It has a stable scissor mechanism, optimized key travel, and a low profile that provide control and comfort. And it pairs immediately with your iMac right out of the box.

- **Magic Keyboard with Numeric Keypad**

You get all the functionality of Magic Keyboard, with an extended layout that makes it even easier to work and play. The new Magic Keyboard with Numeric Keypad includes document navigation controls — page up, page down, home, and end — and full-size arrow keys that are perfect for navigating pro apps, moving through spreadsheets, and playing games.

- **Magic Mouse 2**

Magic Mouse 2 comes standard with your iMac. The design of Magic Mouse 2 lets it glide smoothly across your desk. And since it supports Multi-Touch, you can use simple gestures on its surface to do things such as swipe between web pages and scroll through documents.

- **Magic Trackpad 2**

If you prefer using a trackpad, Magic Trackpad 2 gives you the full range of Multi-Touch gestures and introduces Force Touch to the desktop. Sensors underneath the trackpad surface detect subtle differences in the amount of pressure you apply, bringing more functionality to your fingertips and enabling a deeper connection to your content. This design, along with a low profile, makes it extremely comfortable to use.

## Wireless

- **Wi-Fi**

802.11ac Wi-Fi wireless networking

IEEE 802.11a/b/g/n compatible

- **Bluetooth**

Bluetooth 4.2 wireless technology

## Size and Weight

- Height: 17.7 inches (45.0 cm)
- Width: 20.8 inches (52.8 cm)
- Stand depth: 6.9 inches (17.5 cm)
- Weight: 12.5 pounds (5.66 kg)<sup>2</sup>

## Electrical and Operating Requirements

- Line voltage: 100–240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet

## In the Box

- 21.5-inch iMac
- Magic Keyboard
- Magic Mouse 2
- Power cord
- Lightning to USB Cable

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.

[Learn more](#)

## Accessibility

# 758\_iMac (21.5-inch, 2017) - Technical Specifications.pdf

Accessibility features help people with disabilities get the most out of their new iMac. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>3</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## Configure to Order

Configure your iMac with these options.

Looking for an iMac you can mount on a wall or an adjustable arm? [Choose an iMac with a Built-in VESA Mount Adapter.](#)

- Magic Trackpad 2
- Magic Keyboard with Numeric Keypad
- 16GB memory upgrade
- 1TB Fusion Drive
- 256GB SSD

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>4</sup>
- Beryllium-free
- Mercury-free LED-backlit display
- Recyclable aluminum enclosure
- Speaker enclosures made with 60 percent post-consumer recycled plastic
- Fan assembly made with 26 percent bio-based plastic
- Meets ENERGY STAR Version 6.1 requirements

# 758\_iMac (21.5-inch, 2017) - Technical Specifications.pdf

- Rated EPEAT Gold<sup>5</sup>

## Apple and the Environment

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## Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it’s in good shape, you can trade it in for Apple Store credit. If it’s not eligible for credit, we’ll recycle it responsibly at no cost to you. Good for you. Good for the planet.  
[See how it works](#)

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

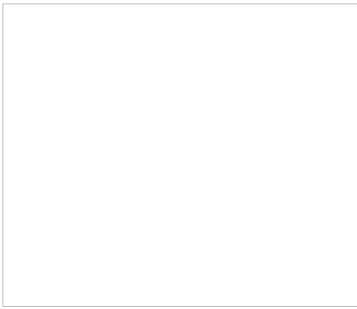
	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	2.0 ( $K_v=0.3$ )	11
Wireless web	1.9 ( $K_v=0.3$ )	11
Hard drive seek	2.0 ( $K_v=0.3$ )	12

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WAd}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.3GHz dual-core Intel Core i5 processor, 8GB memory, 1TB hard drive, Intel Iris Plus Graphics 640.

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  4. PVC-free AC power cord available in all regions except India and South Korea.
  5. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Jun 18, 2018

# iMac (Retina 4K, 21.5-inch, 2017) - Technical Specifications



## Display

- Retina 4K display
- 21.5-inch (diagonal) Retina 4K display
- 4096-by-2304 resolution with support for one billion colors
- 500 nits brightness
- Wide color (P3)

## Processor

- **3.0GHz**  
3.0GHz quad-core Intel Core i5 (Turbo Boost up to 3.5GHz)  
*Configurable to 3.6GHz quad-core Intel Core i7 (Turbo Boost up to 4.2GHz)*
- **3.4GHz**  
3.4GHz quad-core Intel Core i5 (Turbo Boost up to 3.8GHz)  
*Configurable to 3.6GHz quad-core Intel Core i7 (Turbo Boost up to 4.2GHz)*

## Memory

- **3.0GHz**  
8GB of 2400MHz DDR4 memory  
*Configurable to 16GB*
- **3.4GHz**  
8GB of 2400MHz DDR4 memory  
*Configurable to 16GB or 32GB*

## Storage<sup>1</sup>

- **3.0GHz**  
1TB (5400-rpm) hard drive  
*Configurable to 1TB Fusion Drive or 256GB or 512GB SSD*
- **3.4GHz**  
1TB Fusion Drive  
*Configurable to 256GB, 512GB, or 1TB SSD*

## Graphics

- **3.0GHz**  
Radeon Pro 555 with 2GB of VRAM
- **3.4GHz**  
Radeon Pro 560 with 4GB of VRAM

## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display at millions of colors (21.5-inch) or 1 billion colors (21.5-inch 4K) and:
  - One 5120-by-2880 (5K) external display at 60Hz with support for 1 billion colors, or
  - Two 3840-by-2160 (4K UHD) external displays at 60Hz with support for 1 billion colors, or
  - Two 4096-by-2304 (4K) external displays at 60Hz with support for millions of colors
- Thunderbolt 3 digital video output
- Native DisplayPort output over USB-C

# 759\_iMac (Retina 4K, 21.5-inch, 2017) - Technical Specifications.pdf

- Thunderbolt 2, HDMI, DVI, and VGA output supported using adapters (sold separately)

## Audio

- Stereo speakers
- Microphone
- 3.5 mm headphone jack
  - Support for Apple iPhone headset with microphone

## Connections and Expansion

- 3.5 mm headphone jack
- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt 3 (USB-C) ports with support for:
  - DisplayPort
  - Thunderbolt (up to 40 Gbps)
  - USB 3.1 Gen 2 (up to 10 Gbps)
  - Thunderbolt 2, HDMI, DVI, and VGA supported using adapters (sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Kensington lock slot

## Input

- **Magic Keyboard**  
Magic Keyboard comes standard with your iMac. It's wireless and rechargeable (so you won't be replacing batteries), with an ultracompact, edge-to-edge design that wastes no surface space. It has a stable scissor mechanism, optimized key travel, and a low profile that provide control and comfort. And it pairs immediately with your iMac right out of the box.
- **Magic Keyboard with Numeric Keypad**  
You get all the functionality of Magic Keyboard, with an extended layout that makes it even easier to work and play. The new Magic Keyboard with Numeric Keypad includes document navigation controls — page up, page down, home, and end — and full-size arrow keys that are perfect for navigating pro apps, moving through spreadsheets, and playing games.
- **Magic Mouse 2**  
Magic Mouse 2 comes standard with your iMac. The design of Magic Mouse 2 lets it glide smoothly across your desk. And since it supports Multi-Touch, you can use simple gestures on its surface to do things such as swipe between web pages and scroll through documents.
- **Magic Trackpad 2**  
If you prefer using a trackpad, Magic Trackpad 2 gives you the full range of Multi-Touch gestures and introduces Force Touch to the desktop. Sensors underneath the trackpad surface detect subtle differences in the amount of pressure you apply, bringing more functionality to your fingertips and enabling a deeper connection to your content. This design, along with a low profile, makes it extremely comfortable to use.

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking  
IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Size and Weight

- Height: 17.7 inches (45.0 cm)
- Width: 20.8 inches (52.8 cm)
- Stand depth: 6.9 inches (17.5 cm)
- Weight: 12.5 pounds (5.66 kg)<sup>2</sup>

## Electrical and Operating Requirements

- Line voltage: 100–240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet

# 759\_iMac (Retina 4K, 21.5-inch, 2017) - Technical Specifications.pdf

## In the Box

- 21.5-inch iMac with Retina 4K display
- Magic Keyboard
- Magic Mouse 2
- Power cord
- Lightning to USB Cable

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iMac. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>3</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## Configure to Order

Configure your iMac with these options.

Looking for an iMac you can mount on a wall or an adjustable arm? [Choose an iMac with a Built-in VESA Mount Adapter.](#)

- **3.0GHz**
  - Magic Trackpad 2
  - Magic Keyboard with Numeric Keypad



- 3.6GHz quad-core Intel Core i7 upgrade
- 16GB memory upgrade
- 1TB Fusion Drive
- 256GB or 512GB SSD
- **3.4GHz**
  - Magic Trackpad 2
  - Magic Keyboard with Numeric Keypad
  - 3.6GHz quad-core Intel Core i7 upgrade
  - 16GB or 32GB memory upgrade
  - 256GB, 512GB, or 1TB SSD

iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>4</sup>
- Beryllium-free
- Mercury-free LED-backlit display
- Recyclable aluminum enclosure
- Speaker enclosures made with 60 percent post-consumer recycled plastic
- Fan assembly made with 26 percent bio-based plastic
- Meets ENERGY STAR requirements
- Rated EPEAT Gold<sup>5</sup>

Apple and the Environment

[Learn more](#) about Apple’s dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it’s in good shape, you can trade it in for Apple Store credit. If it’s not eligible for credit, we’ll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	2.0 (K <sub>v</sub> =0.3)	11
Wireless web	2.0 (K <sub>v</sub> =0.3)	11
Hard drive seek	2.0 (K <sub>v</sub> =0.3)	12

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4. K<sub>v</sub> is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and K<sub>v</sub>.
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 3.4GHz quad-core Intel Core i5 processor, 8GB memory, 1TB hard drive, Radeon Pro 560 Graphics.

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  4. PVC-free AC power cord available in all regions except India and South Korea.
  5. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

# 759\_iMac (Retina 4K, 21.5-inch, 2017) - Technical Specifications.pdf

Published Date: Sep 12, 2018

# PowerBook G4 (DVI) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (DVI) - Technical Specifications

Configurations		
Order no.	M8591LL/A	M8592LL/A
Processor	667MHz PowerPC G4	800MHz PowerPC G4
Level 3 cache (DDR SDRAM)	1MB with 2.6-GBps throughput	1MB with 3.2-GBps throughput
Memory (PC133 SDRAM)	256MB	512MB
Display	15.2-inch (diagonal) TFT	15.2-inch (diagonal) TFT
Graphics	ATI Mobility Radeon 7500 with 32MB of DDR SDRAM	ATI Mobility Radeon 7500 with 32MB of DDR SDRAM
Hard disk drive <sup>1</sup>	30GB Ultra ATA	40GB Ultra ATA
Optical drive	Slot-loading Combo (DVD-ROM/CD-RW)	Slot-loading Combo (DVD-ROM/CD-RW)
Wireless networking <sup>5</sup>	AirPort ready	Built-in AirPort Card
Ethernet	Built-in 10/100/1000BASE-T	Built-in 10/100/1000BASE-T
Modem <sup>6</sup>	56K	56K

All models include a built-in keyboard and trackpad; modem cable; power adapter; S-video to composite adapter; DVI to VGA adapter; Mac OS X v10.1, Mac OS 9.2, QuickTime 5, iMovie 2, iTunes 2, iPhoto, Mac OS X Mail, Acrobat Reader, Art Directors Toolkit, EarthLink, FAXstf, Graphic Converter, Microsoft Internet Explorer, OmniGraffle, OmniOutliner, PCalc, PixelNance, and Snapz Pro X software; Apple Hardware Test CD; complete setup, learning, and reference documentation; limited warranty; and 30 days of free Internet service through EarthLink.

Internet access requires an Internet service account; fees may apply. Product contains electronic documentation. Backup copy of software is provided on CD-ROM.

Options	
Product	Order no.
AirPort Card	M7600LL/D
AirPort Base Station	M8209LL/A
Apple Portable Power Adapter	M8743LL/A
Apple Pro Keyboard (White)	M8733LL/A
Apple Pro Mouse (White)	M8732ZM/A
Apple DVI to ADC Adapter	M8661LL/A
Apple DVI to VGA Adapter	M8754G/A
Final Cut Pro 3	M8562Z/A
iPod (5GB)	M8513LL/A
iPod (10GB)	M8709LL/A
PowerBook G4 Rechargeable Battery	M8244G/B
AppleCare Protection Plan	M8109LL/A

## Technical Specifications

Processor and memory

- 667MHz or 800MHz PowerPC G4 processor with Velocity Engine
- 1MB of DDR SDRAM level 3 cache
- 133MHz system bus
- 256MB or 512MB of PC133 SDRAM; two SO-DIMM slots support up to 1GB

Storage

- 30GB or 40GB 4200-rpm Ultra ATA/66 hard disk drive (60GB 5400-rpm drive available in build-to order computers)<sup>1</sup>
- Slot-loading Combo drive (DVD-ROM/CD-RW) reads DVDs at 8x and CDs at 24x; writes CD-R and CD-RW discs at 8x

Communications

- Built-in 10/100/1000BASE-T Ethernet (RJ-45 connector)
- Built-in 56K V.90 modem (RJ-11 connector)<sup>6</sup>
- Built-in 11-Mbps AirPort Card (IEEE 802.11 DSSS compliant) in 800MHz configuration; 667MHz configuration is AirPort ready<sup>5</sup>

Expansion

- One 400-Mbps FireWire (IEEE 1394) port<sup>10</sup>
- Two 12-Mbps USB ports
- One PC Card/CardBus slot supporting one Type I or Type II card

Video and graphics support

- Built-in 2D/3D graphics acceleration through an integrated ATI Mobility Radeon 7500 graphics processor with AGP 4X support and 32MB of DDR SDRAM video memory
  - Support for dual display and video mirroring: Millions of colors on the built-in display and on an external display at up to 2048 by 1536 pixels<sup>11</sup>
  - Support for a single external display: Millions of colors on an external display at up to 2048 by 1536 pixels<sup>11</sup>
- DVI output port
- VGA output support with included Apple DVI to VGA Adapter
- S-video output port
- Composite output support with included S-video to composite adapter

Display

- 15.2-inch (diagonal) built-in TFT display
  - Support for millions of colors at 1280-by-854-pixel resolution
  - Support for resolutions of 1280 by 854, 1152 by 768, 896 by 600, 720 by 480, and 640 by 480 pixels at 3:2 aspect ratio
  - Support for resolutions of 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio

Audio

- Audio line in (minijack)
- Audio line out (minijack)
- Two built-in stereo speakers
- Internal omnidirectional microphone

Battery and power

- 55.3-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 5 hours of battery life<sup>4</sup>
- Power adapter with cable management system
- Power adapter port

Security

- Kensington cable lock slot
- Keyboard lock

Keyboard

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded keypad

Trackpad

- Solid-state trackpad for precise cursor control; supports tap, double-tap, and drag capabilities

Electrical requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz

Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –40° to 116° F (–40° to 47° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

Size and weight

- Height: 1.0 inch (2.6 cm)
- Width: 13.4 inches (34.1 cm)
- Depth: 9.5 inches (24.1 cm)
- Weight: 5.4 pounds (2.4 kg) with battery and optical drive installed<sup>3</sup>

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Connection to Apple flat-panel displays requires PowerBook G4 with DVI port and an Apple DVI to ADC Adapter (sold separately).

3. 667MHz model starts at 5.4 pounds with battery and optical drive installed. Actual weight varies by configuration and manufacturing process.

4. Battery life depends on configuration and use.

5. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.

6. Actual modem speeds lower; speed depends on connection rate and other factors.

7. Requires third-party USB adapter and additional Apple software.

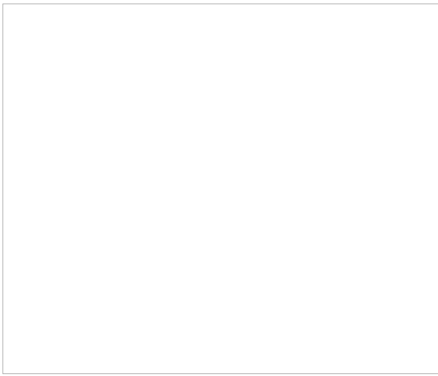
8. iTunes is for legal or rightholder-authorized copying only. Don't steal music.

9. Tests performed on 800MHz system with Adobe Photoshop 7 (April 2002).

10. Actual rates will vary.

11. Some external third-party DVI displays may not support all resolutions.

# iMac (Retina 5K, 27-inch, 2017) - Technical Specifications



## Display

- Retina 5K display
- 27-inch (diagonal) Retina 5K display
- 5120-by-2880 resolution with support for one billion colors
- 500 nits brightness
- Wide color (P3)

## Processor

- **3.4GHz**  
3.4GHz quad-core Intel Core i5 (Turbo Boost up to 3.8GHz)
- **3.5GHz**  
3.5GHz quad-core Intel Core i5 (Turbo Boost up to 4.1GHz)  
*Configurable to 4.2GHz quad-core Intel Core i7 (Turbo Boost up to 4.5GHz)*
- **3.8GHz**  
3.8GHz quad-core Intel Core i5 (Turbo Boost up to 4.2GHz)  
*Configurable to 4.2GHz quad-core Intel Core i7 (Turbo Boost up to 4.5GHz)*

## Memory

- **3.4GHz**  
8GB (two 4GB) of 2400MHz DDR4 memory; four SO-DIMM slots, user accessible  
*Configurable to 16GB or 32GB*
- **3.5GHz**  
8GB (two 4GB) of 2400MHz DDR4 memory; four SO-DIMM slots, user accessible  
*Configurable to 16GB, 32GB, or 64GB*
- **3.8GHz**  
8GB (two 4GB) of 2400MHz DDR4 memory; four SO-DIMM slots, user accessible  
*Configurable to 16GB, 32GB, or 64GB*

## Storage<sup>1</sup>

- **3.4GHz**  
1TB Fusion Drive  
*Configurable to 2TB Fusion Drive or 256GB, 512GB, or 1TB SSD*
- **3.5GHz**  
1TB Fusion Drive  
*Configurable to 2TB or 3TB Fusion Drive or 256GB, 512GB, or 1TB SSD*
- **3.8GHz**  
2TB Fusion Drive  
*Configurable to 3TB Fusion Drive or 512GB, 1TB, or 2TB SSD*

## Graphics

- **3.4GHz**  
Radeon Pro 570 with 4GB of VRAM
- **3.5GHz**  
Radeon Pro 575 with 4GB of VRAM

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- **3.8GHz**  
Radeon Pro 580 with 8GB of VRAM

## Video Support and Camera

- FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display at 1 billion colors and:
  - One 5120-by-2880 (5K) external display at 60Hz with support for 1 billion colors, or
  - Two 3840-by-2160 (4K UHD) external displays at 60Hz with support for 1 billion colors, or
  - Two 4096-by-2304 (4K) external displays at 60Hz with support for millions of colors
- Thunderbolt 3 digital video output
- Native DisplayPort output over USB-C
- Thunderbolt 2, HDMI, DVI, and VGA output supported using adapters (sold separately)

## Audio

- Stereo speakers
- Microphone
- 3.5 mm headphone jack
  - Support for Apple iPhone headset with microphone

## Connections and Expansion

- 3.5 mm headphone jack
- SDXC card slot
- Four USB 3 ports (compatible with USB 2)
- Two Thunderbolt 3 (USB-C) ports with support for:
  - DisplayPort
  - Thunderbolt (up to 40 Gbps)
  - USB 3.1 Gen 2 (up to 10 Gbps)
  - Thunderbolt 2, HDMI, DVI, and VGA supported using adapters (sold separately)
- 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Kensington lock slot

## Input

- **Magic Keyboard**  
Magic Keyboard comes standard with your iMac. It's wireless and rechargeable (so you won't be replacing batteries), with an ultracompact, edge-to-edge design that wastes no surface space. It has a stable scissor mechanism, optimized key travel, and a low profile that provide control and comfort. And it pairs immediately with your iMac right out of the box.
- **Magic Keyboard with Numeric Keypad**  
You get all the functionality of Magic Keyboard, with an extended layout that makes it even easier to work and play. The new Magic Keyboard with Numeric Keypad includes document navigation controls — page up, page down, home, and end — and full-size arrow keys that are perfect for navigating pro apps, moving through spreadsheets, and playing games.
- **Magic Mouse 2**  
Magic Mouse 2 comes standard with your iMac. The design of Magic Mouse 2 lets it glide smoothly across your desk. And since it supports Multi-Touch, you can use simple gestures on its surface to do things such as swipe between web pages and scroll through documents.
- **Magic Trackpad 2**  
If you prefer using a trackpad, Magic Trackpad 2 gives you the full range of Multi-Touch gestures and introduces Force Touch to the desktop. Sensors underneath the trackpad surface detect subtle differences in the amount of pressure you apply, bringing more functionality to your fingertips and enabling a deeper connection to your content. This design, along with a low profile, makes it extremely comfortable to use.

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking  
IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Size and Weight

- Height: 20.3 inches (51.6 cm)

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- Width: 25.6 inches (65.0 cm)
- Stand depth: 8 inches (20.3 cm)
- Weight: 20.8 pounds (9.44 kg)<sup>2</sup>

## Electrical and Operating Requirements

- Line voltage: 100–240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet

## In the Box

- iMac with Retina 5K display
- Magic Keyboard
- Magic Mouse 2
- Power cord
- Lightning to USB Cable

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iMac. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>3</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes

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- iBooks
- App Store
- Time Machine

## Configure to Order

Configure your iMac with these options.

Looking for an iMac you can mount on a wall or an adjustable arm? [Choose an iMac with a Built-in VESA Mount Adapter.](#)

- **3.4GHz**
  - Magic Trackpad 2
  - Magic Keyboard with Numeric Keypad
  - 16GB or 32GB memory upgrade
  - 2TB Fusion Drive
  - 256GB, 512GB, or 1TB SSD
- **3.5GHz**
  - Magic Trackpad 2
  - Magic Keyboard with Numeric Keypad
  - 4.2GHz quad-core Intel Core i7 upgrade
  - 16GB, 32GB, or 64GB memory upgrade
  - 2TB or 3TB Fusion Drive
  - 256GB, 512GB, or 1TB SSD
- **3.8GHz**
  - Magic Trackpad 2
  - Magic Keyboard with Numeric Keypad
  - 4.2GHz quad-core Intel Core i7 upgrade
  - 16GB, 32GB, or 64GB memory upgrade
  - 3TB Fusion Drive
  - 512GB, 1TB, or 2TB SSD

## iMac and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iMac is designed with the following features to reduce its environmental impact:

- Arsenic-free display glass
- BFR-free
- PVC-free<sup>4</sup>
- Beryllium-free
- Mercury-free LED-backlit display
- Recyclable aluminum enclosure
- Speaker enclosures made with 60 percent post-consumer recycled plastic
- Meets ENERGY STAR Version 6.1 requirements
- Rated EPEAT Gold<sup>5</sup>

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	2.3 (K <sub>p</sub> =0.3)	15
Wireless web	2.3 (K <sub>p</sub> =0.3)	15



760\_iMac (Retina 5K, 27-inch, 2017) - Technical Specifications.pdf

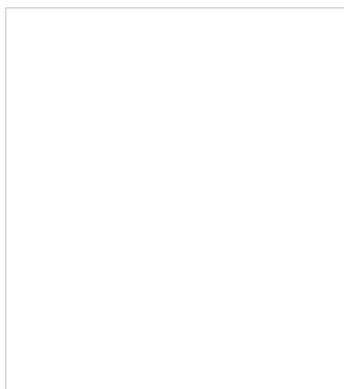
	Sound Power Level <i>L<sub>WA,m</sub></i> (B)	Sound Pressure Level Operator Position <i>L<sub>PA,m</sub></i> (dB)
Hard drive seek	2.3 (K <sub>v</sub> =0.3)	16

1. *L<sub>WA,m</sub>* is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2. *L<sub>PA,m</sub>* is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4. K<sub>v</sub> is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity, *L<sub>WA,c</sub>* (formerly called *L<sub>WAd</sub>*) may be computed from the sum of *L<sub>WA,m</sub>* and K<sub>v</sub>.
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 3.8GHz quad-core Intel Core i5 processor, 8GB memory, 2TB hard drive, Radeon Pro 580 Graphics.

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  4. PVC-free AC power cord available in all regions except India and South Korea.
  5. iMac achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: May 29, 2018

# iPad Pro (12.9-inch) (2nd generation) - Technical Specifications



## Finish

- Space Gray
- Gold
- Silver

## Capacity<sup>1</sup>

- 64GB
- 256GB
- 512GB

## Size and Weight<sup>2</sup>

- **Wi-Fi models**
  - Height: 12 inches (305.7 mm)
  - Width: 8.68 inches (220.6 mm)
  - Depth: 0.27 inch (6.9 mm)
  - Weight: 1.49 pounds (677 grams)
- **Wi-Fi + Cellular models**
  - Height: 12 inches (305.7 mm)
  - Width: 8.68 inches (220.6 mm)
  - Depth: 0.27 inch (6.9 mm)
  - Weight: 1.53 pounds (692 grams)

## Buttons and Connectors

- Smart Connector
- 3.5 mm headphone jack
- Four speaker audio
- On/Off - Sleep/Wake
- Home/Touch ID sensor
- Lightning connector
- Nano-SIM tray
- Volume up/down
- Dual microphones

## In the Box

- iPad Pro
- Lightning to USB Cable
- USB Power Adapter

## Display

- Retina display
- 12.9-inch (diagonal) LED-backlit Multi-Touch display
- 2732-by-2048 resolution at 264 pixels per inch (ppi)
- ProMotion technology

# 761\_iPad Pro (12.9-inch) (2nd generation) - Technical Specifications.pdf

- Wide color display (P3)
- True Tone display
- Fingerprint-resistant oleophobic coating
- Fully laminated display
- Antireflective coating

## Chip

- A10X Fusion chip with 64-bit architecture
- Embedded M10 coprocessor

## Camera

- 12-megapixel camera
- *f*/1.8 aperture
- Digital zoom up to 5x
- Optical image stabilization
- Six-element lens
- Quad-LED True Tone flash
- Panorama (up to 63 megapixels)
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels
- Tap to focus with Focus Pixels
- Live Photos with stabilization
- Wide color capture for photos and Live Photos
- Improved local tone mapping
- Body and face detection
- Exposure control
- Noise reduction
- Auto HDR for photos
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging

## Video Recording

- 4K video recording at 30 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Optical image stabilization for video
- Quad-LED True Tone flash
- Slo-mo video support for 1080p at 120 fps and 720p at 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Body and face detection
- Noise reduction
- Take 8-megapixel still photos while recording 4K video
- Playback zoom
- Video geotagging

## FaceTime HD Camera

- 7-megapixel photos
- 1080p HD video recording
- Retina Flash
- *f*/2.2 aperture
- Wide color capture for photos and Live Photos
- Auto HDR
- Backside illumination sensor
- Body and face detection
- Auto image stabilization

# 761\_iPad Pro (12.9-inch) (2nd generation) - Technical Specifications.pdf

- Burst mode
- Exposure control
- Timer mode

## Video Calling<sup>3</sup>

- FaceTime video
- iPad to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Calling<sup>3</sup>

- FaceTime audio
- iPad to any FaceTime-enabled device over Wi-Fi or cellular

## Speakers

- Four speaker audio

## Microphones

- Dual microphones for calls, video recording, and audio recording

## Cellular and Wireless

- **All models**  
Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO  
Bluetooth 4.2 technology
- **Wi-Fi + Cellular models**  
UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)  
CDMA EV-DO Rev. A and Rev. B (800, 1900 MHz)  
LTE Advanced (Bands 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 17, 18, 19, 20, 21, 25, 26, 27, 28, 29, 30, 38, 39, 40, 41)<sup>4</sup>  
Data only<sup>5</sup>  
Wi-Fi calling<sup>4</sup>  
Embedded Apple SIM<sup>6</sup>  
[Learn more about Apple SIM](#)

## SIM Card

- Nano-SIM (supports Apple SIM)
- Embedded Apple SIM<sup>6</sup>

## Location

- **All models**
  - Digital compass
  - Wi-Fi
  - iBeacon microlocation
- **Wi-Fi + Cellular models**
  - Assisted GPS and GLONASS
  - Cellular

## Sensors

- Touch ID
- Three-axis gyro
- Accelerometer
- Barometer
- Ambient light sensor

## Touch ID

- Unlock iPad
- Secure personal data within apps
- Make purchases from the iTunes Store, the App Store, and Apple Books

## Apple Pay

- Pay with your iPad using Touch ID within apps and on the web
- Send and receive money in Messages

[Learn more about Apple Pay](#)

## Siri<sup>7</sup>

- Use your voice to send messages, set reminders, and more
- Get proactive suggestions
- Use hands-free
- Listen and identify songs

[Learn more about Siri](#)

## Power and Battery<sup>8</sup>

- **12.9-inch iPad Pro**
  - Built-in 41-watt-hour rechargeable lithium-polymer battery
- **All models**
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- **Wi-Fi + Cellular models**
  - Up to 9 hours of surfing the web using cellular data network

## Operating System

### iOS 12

iOS is the world's most personal and secure mobile operating system, packed with powerful features that help you get the most out of every day.

[See what's new in iOS 12](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPad Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Siri and Dictation
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- Voice Memos
- Contacts

# 761\_iPad Pro (12.9-inch) (2nd generation) - Technical Specifications.pdf

- Books
- Home
- Reminders
- Stocks
- Clock
- TV
- News
- Photo Booth
- Podcasts
- Measure
- Find My iPhone
- Find My Friends
- Files

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled on iPad.*

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Apple Store
- Trailers
- Remote
- Music Memos
- Clips
- Swift Playgrounds
- Shortcuts

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>9</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X 10.9.5 or later
- PC: Windows 7 or later
- iTunes 12.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Languages

- **Language support**  
English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **QuickType keyboard support**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh
- **QuickType keyboard support with predictive input**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish
- **Siri languages**  
English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean,

# 761\_iPad Pro (12.9-inch) (2nd generation) - Technical Specifications.pdf

Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

- **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghainese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

- **Thesaurus**

English (UK, U.S.)

- **Bilingual dictionary support**

Arabic, Chinese (Simplified), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish

- **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Supports Dolby Vision and HDR10 content
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

- 
1. Available space is less and varies due to many factors. A standard configuration uses approximately 10GB to 12GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
  2. Size and weight vary by configuration and manufacturing process.
  3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
  4. Data plan required. LTE Advanced, LTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).

## 761\_iPad Pro (12.9-inch) (2nd generation) - Technical Specifications.pdf

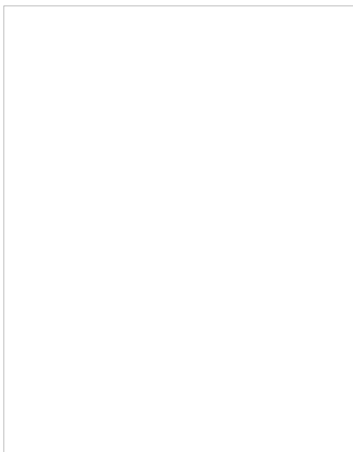
5. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
6. Embedded Apple SIM in iPad Pro may be disabled when purchased from some carriers. See your carrier for details. Apple SIM and embedded Apple SIM not available in China.
7. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
8. Testing conducted by Apple in May 2017 using preproduction iPad Pro (10.5-inch) and iPad Pro (12.9-inch) (2nd generation) units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.
9. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: Sep 18, 2018



# iPad Pro (10.5-inch) - Technical Specifications



## Finish

- Space Gray
- Rose Gold
- Gold
- Silver

## Capacity<sup>1</sup>

- 64GB
- 256GB
- 512GB

## Size and Weight<sup>2</sup>

- **Wi-Fi models**
  - Height: 9.8 inches (250.6 mm)
  - Width: 6.8 inches (174.1 mm)
  - Depth: 0.24 inch (6.1 mm)
  - Weight: 1.03 pounds (469 grams)
- **Wi-Fi + Cellular models**
  - Height: 9.8 inches (250.6 mm)
  - Width: 6.8 inches (174.1 mm)
  - Depth: 0.24 inch (6.1 mm)
  - Weight: 1.05 pounds (477 grams)

## Buttons and Connectors

- Smart Connector
- 3.5 mm headphone jack
- Four speaker audio
- On/Off— Sleep/Wake
- Home/Touch ID sensor
- Lightning connector
- Nano-SIM tray
- Volume up/down
- Dual microphones

## In the Box

- iPad Pro
- Lightning to USB Cable
- USB Power Adapter

## Display

- Retina display

# 762\_iPad Pro (10.5-inch) - Technical Specifications.pdf

- 10.5-inch (diagonal) LED-backlit Multi-Touch display
- 2224-by-1668 resolution at 264 pixels per inch (ppi)
- ProMotion technology
- Wide color display (P3)
- True Tone display
- Fingerprint-resistant oleophobic coating
- Fully laminated display
- Antireflective coating

## Chip

- A10X Fusion chip with 64-bit architecture
- Embedded M10 coprocessor

## Camera

- 12-megapixel camera
- $f/1.8$  aperture
- Digital zoom up to 5x
- Optical image stabilization
- Six-element lens
- Quad-LED True Tone flash
- Panorama (up to 63 megapixels)
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels
- Tap to focus with Focus Pixels
- Live Photos with stabilization
- Wide color capture for photos and Live Photos
- Improved local tone mapping
- Body and face detection
- Exposure control
- Noise reduction
- Auto HDR for photos
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging

## Video Recording

- 4K video recording at 30 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Optical image stabilization for video
- Quad-LED True Tone flash
- Slo-mo video support for 1080p at 120 fps and 720p at 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Body and face detection
- Noise reduction
- Take 8-megapixel still photos while recording 4K video
- Playback zoom
- Video geotagging

## FaceTime HD Camera

- 7-megapixel photos
- 1080p HD video recording
- Retina Flash
- $f/2.2$  aperture
- Wide color capture for photos and Live Photos
- Auto HDR

# 762\_iPad Pro (10.5-inch) - Technical Specifications.pdf

- Backside illumination sensor
- Body and face detection
- Auto image stabilization
- Burst mode
- Exposure control
- Timer mode

## Video Calling<sup>3</sup>

- FaceTime video
- iPad to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Calling<sup>3</sup>

- FaceTime audio
- iPad to any FaceTime-enabled device over Wi-Fi or cellular

## Speakers

- Four speaker audio

## Microphones

- Dual microphones for calls, video recording, and audio recording

## Cellular and Wireless

- **All models**  
Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO  
Bluetooth 4.2 technology
- **Wi-Fi + Cellular models**  
UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)  
CDMA EV-DO Rev. A and Rev. B (800, 1900 MHz)  
LTE Advanced (Bands 1, 2, 3, 4, 5, 7, 8, 11, 12, 13, 17, 18, 19, 20, 21, 25, 26, 27, 28, 29, 30, 38, 39, 40, 41)<sup>4</sup>  
Data only<sup>5</sup>  
Wi-Fi calling<sup>4</sup>  
Embedded Apple SIM<sup>6</sup>  
[Learn more about Apple SIM](#)

## SIM Card

- Nano-SIM (supports Apple SIM)
- Embedded Apple SIM<sup>6</sup>

## Location

- **All models**
  - Digital compass
  - Wi-Fi
  - iBeacon microlocation
- **Wi-Fi + Cellular models**
  - Assisted GPS and GLONASS
  - Cellular

## Sensors

- Touch ID
- Three-axis gyro
- Accelerometer
- Barometer
- Ambient light sensor

## Touch ID

# 762\_iPad Pro (10.5-inch) - Technical Specifications.pdf

- Unlock iPad
- Secure personal data within apps
- Make purchases from the iTunes Store, the App Store, and Apple Books

## Apple Pay

- Pay with your iPad using Touch ID within apps and on the web
- Send and receive money in Messages

[Learn more about Apple Pay](#)

## Siri<sup>7</sup>

- Use your voice to send messages, set reminders, and more
- Get proactive suggestions
- Use hands-free
- Listen and identify songs

[Learn more about Siri](#)

## Power and Battery<sup>8</sup>

- **10.5-inch iPad Pro**
  - Built-in 30.4-watt-hour rechargeable lithium-polymer battery
- **All models**
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- **Wi-Fi + Cellular models**
  - Up to 9 hours of surfing the web using cellular data network

## Operating System

### iOS 12

iOS is the world's most personal and secure mobile operating system, packed with powerful features that help you get the most out of every day.

[See what's new in iOS 12](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPad Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Siri and Dictation
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store

# 762\_iPad Pro (10.5-inch) - Technical Specifications.pdf

- Notes
- Voice Memos
- Contacts
- Books
- Home
- Reminders
- Stocks
- Clock
- TV
- News
- Photo Booth
- Podcasts
- Measure
- Find My iPhone
- Find My Friends
- Files

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled on iPad.*

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Apple Store
- Trailers
- Remote
- Music Memos
- Clips
- Swift Playgrounds
- Shortcuts

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>9</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X 10.9.5 or later
- PC: Windows 7 or later
- iTunes 12.5 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Languages

- **Language support**  
English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **QuickType keyboard support**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh
- **QuickType keyboard support with predictive input**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

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- **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

- **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

- **Thesaurus**

English (UK, U.S.)

- **Bilingual dictionary support**

Arabic, Chinese (Simplified), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish

- **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Supports Dolby Vision and HDR10 content
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- **Viewable document types**

.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

- 
1. Available space is less and varies due to many factors. A standard configuration uses approximately 10GB to 12GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
  2. Size and weight vary by configuration and manufacturing process.
  3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.

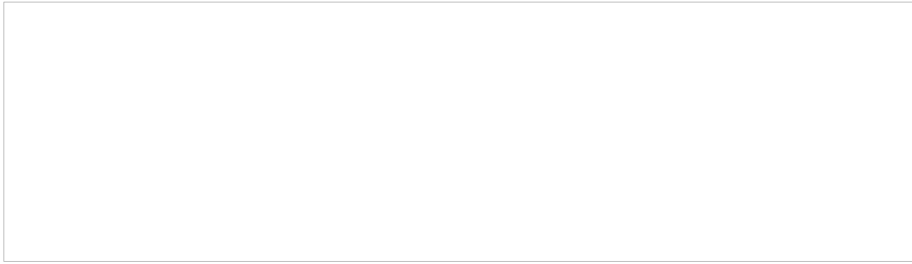
## 762\_iPad Pro (10.5-inch) - Technical Specifications.pdf

4. Data plan required. LTE Advanced, LTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).
5. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
6. Embedded Apple SIM in iPad Pro may be disabled when purchased from some carriers. See your carrier for details. Apple SIM and embedded Apple SIM not available in China.
7. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
8. Testing conducted by Apple in May 2017 using preproduction iPad Pro (10.5-inch) and iPad Pro (12.9-inch) (2nd generation) units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.
9. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Published Date: Sep 18, 2018

# Magic Keyboard with Numeric Keypad - Technical Specifications



## Overview

Magic Keyboard with Numeric Keypad features an extended layout, with document navigation controls for quick scrolling and full-size arrow keys for gaming. A scissor mechanism beneath each key allows for increased stability, while optimized key travel and a low profile provide a comfortable and precise typing experience. The numeric keypad is also great for spreadsheets and finance applications. And the built-in, rechargeable battery is incredibly long-lasting, powering your keyboard for about a month or more between charges.<sup>1</sup>

## What's in the Box

- Magic Keyboard with Numeric Keypad
- Lightning to USB Cable

## Size and Weight

- Height: 0.16–0.43 inch (0.41–1.09 cm)
- Width: 16.48 inches (41.87 cm)
- Depth: 4.52 inches (11.49 cm)
- Weight: 0.86 pound (0.39 kg)\*

## General

- Multimedia keys

## Connections and Expansion

- Bluetooth
- Lightning port
- Wireless

## System Requirements

- Bluetooth-enabled Mac computer with macOS 10.12.4 or later
- iOS devices with iOS 10.3 or later

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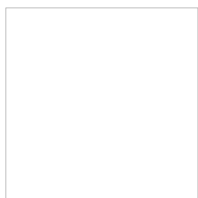
\*Weight varies by configuration and manufacturing process.

1. Testing conducted by Apple in April 2017 using preproduction Magic Keyboard devices, firmware, and software with shipping iMac systems. Testing consisted of full battery discharge while engaging the device on a paired iMac using automated equipment. Battery life depends on device settings, usage, and other factors.

Published Date: Aug 30, 2017



# macOS High Sierra - Technical Specifications



## General Requirements

- OS X 10.8 or later
- 2GB of memory
- 14.3GB of available storage to perform upgrade\*
- Some features require an Apple ID; terms apply.
- Some features require a compatible Internet service provider; fees may apply.

## Mac Hardware Requirements

For details about your Mac model, click the Apple icon at the top left of your screen, choose About This Mac. These Mac models are compatible with macOS High Sierra:

- MacBook (Late 2009 or newer)
- MacBook Pro (Mid 2010 or newer)
- MacBook Air (Late 2010 or newer)
- Mac mini (Mid 2010 or newer)
- iMac (Late 2009 or newer)
- Mac Pro (Mid 2010 or newer)

## Feature Requirements

### Siri

Requires a broadband Internet connection and microphone (built-in or external).

### Dictation

Requires a microphone (built in or external).

### Spotlight Suggestions

Requires a broadband Internet connection.

### Gestures

Requires a Multi-Touch trackpad, Force Touch trackpad, Magic Trackpad, or Magic Mouse.

Force Touch gestures require a Force Touch trackpad.

VoiceOver gestures require a Multi-Touch trackpad, Force Touch trackpad, or Magic Trackpad.

### Photo Booth

Requires a FaceTime or iSight camera (built in or external), or USB video class (UVC) camera.

### FaceTime

Video calls require a built-in FaceTime camera, an iSight camera (built in or external), or a USB video class (UVC) camera; and broadband Internet connection.

[Learn more](#)

## Handoff, Instant Hotspot, and Universal Clipboard

Supported by the following Mac models:

- MacBook (Early 2015 or newer)

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- MacBook Pro (2012 or newer)
- MacBook Air (2012 or newer)
- Mac mini (2012 or newer)
- iMac (2012 or newer)
- Mac Pro (Late 2013)

Handoff requires an iPhone, iPad, or iPod touch with a Lightning connector and iOS 8 or later.

Instant Hotspot requires an iPhone or iPad with cellular connectivity with a Lightning connector and iOS 8.1 or later. Requires Personal Hotspot service through your carrier.

## Auto Unlock

Supported by Mac models introduced in mid 2013 or later.

Requires an Apple Watch with watchOS 3 or later and an iPhone 5 or later.

## Apple Pay on the Web

Supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro (2012 or newer)
- MacBook Air (2012 or newer)
- Mac mini (2012 or newer)
- iMac (2012 or newer)
- Mac Pro (Late 2013)

Requires MacBook Pro with Touch Bar, iPhone 6 or later with iOS 10 or later, or an Apple Watch with watchOS 3 or later.

## Phone Calling

Requires an iPhone with iOS 8 or later and an activated carrier plan.

## SMS

Requires an iPhone with iOS 8.1 or later and an activated carrier plan.

## AirDrop

AirDrop between Mac computers and iOS devices is supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro (2012 or newer)
- MacBook Air (2012 or newer)
- Mac mini (2012 or newer)
- iMac (2012 or newer)
- Mac Pro (Late 2013)

AirDrop to iOS devices requires an iPhone, iPad, or iPod touch with a Lightning connector and iOS 7 or later.

AirDrop between two Mac computers is supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook (Late 2008 Aluminum or newer)
- MacBook Pro (Late 2008 or newer)
- MacBook Air (Late 2010 or newer)
- Mac mini (Mid 2010 or newer)
- iMac (Early 2009 or newer)
- Mac Pro (Early 2009 with AirPort Extreme card, or Mid 2010 or newer)

## AirPlay

AirPlay Mirroring requires an Apple TV (2nd generation or later). Supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro (Early 2011 or newer)
- MacBook Air (Mid 2011 or newer)
- Mac mini (Mid 2011 or newer)

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- iMac (Mid 2011 or newer)
- Mac Pro (Late 2013)

AirPlay for web video requires an Apple TV (2nd generation or later).

Peer-to-peer AirPlay requires a Mac (2012 or later) and an Apple TV (3rd generation rev A, model A1469 or later) with Apple TV software 7.0 or later.

## Apple File System

Requires a Mac with all-flash internal storage.

## Metal 2

Supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro (Mid 2012 or newer)
- MacBook Air (Mid 2012 or newer)
- Mac mini (Late 2012 or newer)
- iMac (Late 2012 or newer)
- Mac Pro (Late 2013)

## Time Machine

Requires an additional hard drive (sold separately).

## Power Nap

Supported by the following Mac models:

- MacBook (Early 2015 or newer)
- MacBook Pro with Retina display (Mid 2012 or newer)
- MacBook Air (Late 2010 or newer)
- Mac mini (Late 2012 or newer)
- iMac (Late 2012 or newer)
- Mac Pro (Late 2013)

## Boot Camp

Allows Boot Camp installations of Windows 10, Windows 8.1, and Windows 7 on supported Mac models.

[Learn more](#)

## Exchange Support

Requires Microsoft Office 365, Exchange 2016, Exchange 2013, or Exchange Server 2010. Installing the latest Service Packs is recommended.

## Mac App Store

Available only to persons age 13 or older in the U.S. and many other countries and regions.

## What's Included

### Applications

- App Store
- Automator
- Calculator
- Calendar
- Chess
- Contacts
- Dashboard
- Dictionary
- DVD Player
- FaceTime
- Font Book
- iBooks

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- Image Capture
- iTunes
- Launchpad
- Mail
- Maps
- Messages
- Mission Control
- Notes
- Photo Booth
- Photos
- Preview
- QuickTime Player
- Reminders
- Safari
- Siri
- Stickies
- System Preferences
- TextEdit
- Time Machine

## Utilities

- Activity Monitor
- AirPort Utility
- Audio MIDI Setup
- Bluetooth File Exchange
- Boot Camp Assistant
- ColorSync Utility
- Console
- Digital Color Meter
- Disk Utility
- Grab
- Grapher
- Keychain Access
- Migration Assistant
- Script Editor
- System Information
- Terminal
- VoiceOver Utility

## Languages

- Arabic
- Catalan
- Croatian
- Simplified Chinese
- Traditional Chinese
- Czech
- Danish
- Dutch
- English
- Finnish
- French
- German
- Greek
- Hebrew
- Hindi
- Hungarian
- Indonesian
- Italian
- Japanese
- Korean
- Malay
- Norwegian
- Polish

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- Brazilian Portuguese
- Portuguese
- Romanian
- Russian
- Slovak
- Spanish
- Spanish (Latin America)
- Swedish
- Thai
- Turkish
- Ukrainian
- Vietnamese

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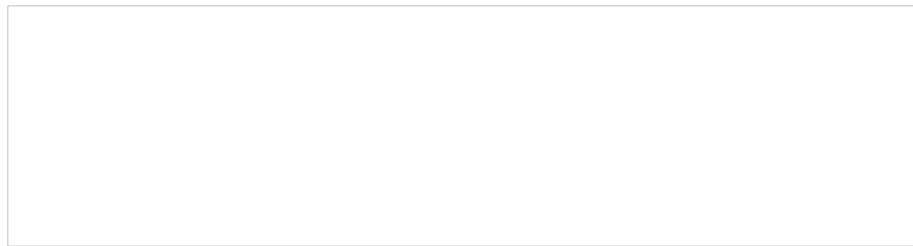
\* Upon completion of the upgrade, macOS High Sierra requires approximately 1.5GB more storage space than macOS Sierra 10.12.6

Some features may not be available for all countries or regions. [Click here to see complete list.](#)

iCloud requires iOS 5 or later on iPhone 3GS or later, iPod touch (3rd generation or later), iPad Pro, iPad Air or later, iPad or later, or iPad mini or later; a Mac computer with OS X Lion 10.7.5 or later; or a PC with Windows 7 or Windows 8 (Outlook 2007 or later or an up-to-date browser is required for accessing email, contacts, and calendars). Some features require iOS 11 and macOS High Sierra. Some features require a Wi-Fi connection. Some features are not available in all countries or regions. Access to some services is limited to 10 devices.

Published Date: Sep 12, 2018

# Apple Watch Series 3 - Technical Specifications



## Model

- **Series 3 GPS + Cellular**
  - **Apple Watch**  
Aluminum case with Sport Band or Sport Loop  
Stainless steel case with Sport Band or Milanese Loop
  - **Apple Watch Nike+**  
Aluminum case with Nike Sport Band or Nike Sport Loop
  - **Apple Watch Hermès**  
Stainless steel case with Hermès leather band  
Additional Sport Band included with purchase
  - **Apple Watch Edition**  
Ceramic case with Sport Band
- **Series 3 GPS**
  - **Apple Watch**  
Aluminum case with Sport Band
  - **Apple Watch Nike+**  
Aluminum case with Nike Sport Band

## Chip

- Faster dual-core processor
- Apple wireless chip

## Features

- **Series 3 GPS + Cellular**
  - GPS, GLONASS, Galileo, and QZSS
  - Barometric altimeter
  - Water resistant 50 meters<sup>1</sup>
  - Heart rate sensor
  - Accelerometer
  - Gyroscope
  - Ambient light sensor
  - Siri speaks
  - Capacity 16GB
  - Ceramic back
- **Series 3 GPS**
  - GPS, GLONASS, Galileo, and QZSS
  - Barometric altimeter
  - Water resistant 50 meters<sup>1</sup>
  - Heart rate sensor
  - Accelerometer
  - Gyroscope
  - Ambient light sensor
  - Siri speaks
  - Capacity 8GB
  - Composite back

## Connectivity

- **Series 3 GPS + Cellular**
  - LTE and UMTS<sup>2</sup>
  - Wi-Fi (802.11b/g/n 2.4GHz)
  - Bluetooth 4.2[Learn more about available carriers](#)
- **Series 3 GPS**
  - Wi-Fi (802.11b/g/n 2.4GHz)
  - Bluetooth 4.2

## Display

- **Series 3 GPS + Cellular**
  - Second-generation OLED Retina display with Force Touch
  - 2x brighter (1000 nits)
  - Sapphire crystal (stainless steel and ceramic cases)
  - Ion-X glass (aluminum cases)
  - 272 by 340 pixels (38mm)
  - 312 by 390 pixels (42mm)
- **Series 3 GPS**
  - Second-generation OLED Retina display with Force Touch
  - 2x brighter (1000 nits)
  - Ion-X glass
  - 272 by 340 pixels (38mm)
  - 312 by 390 pixels (42mm)

## Power

- Built-in rechargeable lithium-ion battery
- Up to 18 hours<sup>3</sup>
- Magnetic charging cable
- USB power adapter
- Supports AirPower mat<sup>4</sup>

## Dimensions

- **Aluminum case - 38mm**
  - Height: 38.6mm
  - Width: 33.3mm
  - Depth: 11.4mm
  - Case Weight (GPS): 26.7g
  - Case Weight (GPS + Cellular): 28.7g
- **Aluminum case - 42mm**
  - Height: 42.5mm
  - Width: 36.4mm
  - Depth: 11.4mm
  - Case Weight (GPS): 32.3g
  - Case Weight (GPS + Cellular): 34.9g
- **Stainless Steel case - 38mm**
  - Height: 38.6mm
  - Width: 33.3mm
  - Depth: 11.4mm
  - Case Weight: 42.4g
- **Stainless Steel case - 42mm**
  - Height: 42.5mm
  - Width: 36.4mm
  - Depth: 11.4mm
  - Case Weight: 52.8g
- **White Ceramic case - 38mm**
  - Height: 39.2mm
  - Width: 34.0mm
  - Depth: 11.8mm
  - Case Weight: 40.1g
- **White Ceramic case - 42mm**
  - Height: 42.6mm
  - Width: 36.5mm

- Depth: 11.4mm
- Case Weight: 46.4g

## Languages

- **Language support**

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

- 
1. Apple Watch Series 3 has a water resistance rating of 50 meters under ISO standard 22810:2010. This means that it may be used for shallow-water activities like swimming in a pool or ocean. However, Apple Watch Series 3 should not be used for scuba diving, waterskiing, or other activities involving high-velocity water or submersion below shallow depth.
  2. Wireless service plan required for cellular service. Apple Watch and iPhone service provider must be the same. Not available with all service providers. Not all service providers support enterprise accounts; check with your employer and service provider. Some legacy plans may not be compatible. Prepaid plans are not supported. Coverage dependent on carrier network. Roaming is not available outside your carrier network coverage area. Contact your service provider for more details. Check [www.apple.com/watch/cellular](http://www.apple.com/watch/cellular) for participating wireless carriers and eligibility.
  3. Apple Watch battery testing was conducted by Apple in August 2017 using preproduction Apple Watch Series 3 (GPS) and Apple Watch Series 3 (GPS + Cellular), each paired with an iPhone; all devices were tested with prerelease software. Battery life varies by use, configuration, and many other factors; actual results will vary. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/watch/battery.html](http://www.apple.com/watch/battery.html) for more information.
  4. Available 2018

Apple Watch Series 3 (GPS + Cellular) requires an iPhone 6 or later with iOS 11 or later. Apple Watch Series 3 (GPS) requires an iPhone 5s or later with iOS 11 or later. Apple Watch Series 1 requires an iPhone 5s or later with iOS 11 or later.

Some features may not be available for all countries or regions. [Click here](#) to see complete list.

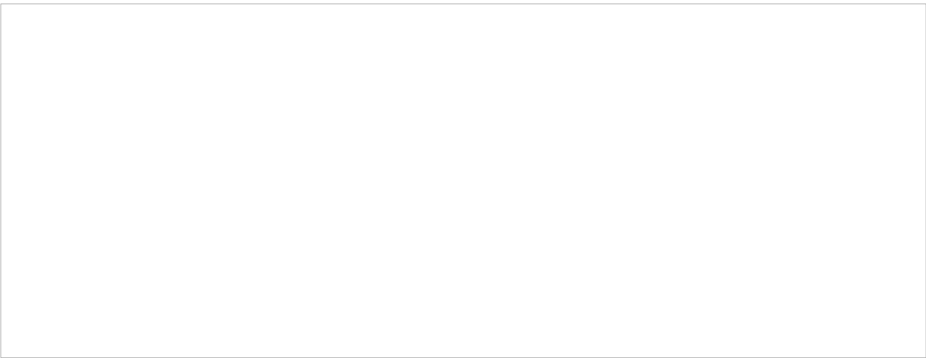
To learn more about wearing Apple Watch, getting a good fit, potential skin sensitivity, and proper care and cleaning, [click here](#).

All models come in distinct case and band combinations. Sport, Woven Nylon, stainless steel, and leather bands are all compatible with all Apple Watch models.

Published Date: Sep 12, 2018



# iPhone 8 - Technical Specifications



## Finish

- Gold
- Silver
- Space Gray
- (PRODUCT)RED™

## Capacity<sup>1</sup>

- 64GB
- 256GB

## Size and Weight<sup>2</sup>

- Height: 5.45 inches (138.4 mm)
- Width: 2.65 inches (67.3 mm)
- Depth: 0.29 inch (7.3 mm)
- Weight: 5.22 ounces (148 grams)

## Display

- Retina HD display
- 4.7-inch (diagonal) widescreen LCD Multi-Touch display with IPS technology
- 1334-by-750-pixel resolution at 326 ppi
- 1400:1 contrast ratio (typical)
- True Tone display
- Wide color display (P3)
- 3D Touch
- 625 cd/m2 max brightness (typical)
- Dual-domain pixels for wide viewing angles
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously
- Display Zoom
- Reachability

## Splash, Water, and Dust Resistant<sup>3</sup>

- Rated IP67 (maximum depth of 1 meter up to 30 minutes) under IEC standard 60529

## Chip

- A11 Bionic chip
- Neural Engine

## Camera

- 12MP camera
- f/1.8 aperture
- Digital zoom up to 5x

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- Optical image stabilization
- Six-element lens
- Quad-LED True Tone flash with Slow Sync
- Panorama (up to 63MP)
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels
- Tap to focus with Focus Pixels
- Live Photos with stabilization
- Wide color capture for photos and Live Photos
- Improved local tone mapping
- Exposure control
- Auto HDR for photos
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging
- Image formats captured: HEIF and JPEG

## Video Recording

- 4K video recording at 24 fps, 30 fps, or 60 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Optical image stabilization for video
- 2x optical zoom; digital zoom up to 6x (iPhone 8 Plus only)
- Quad-LED True Tone flash
- Slo-mo video support for 1080p at 120 fps and 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Take 8MP still photos while recording 4K video
- Playback zoom
- Video geotagging
- Video formats recorded: HEVC and H.264

## FaceTime HD Camera

- 7MP camera
- 1080p HD video recording
- Retina Flash
- $f/2.2$  aperture
- Wide color capture for photos and Live Photos
- Auto HDR for photos
- Backside illumination sensor
- Auto image stabilization
- Burst mode
- Exposure control
- Timer mode

## Touch ID

- Fingerprint sensor built into the Home button

## Apple Pay

- Pay with your iPhone using Touch ID in stores, within apps, and on the web
- Send and receive money in Messages
- Complete purchases made with Apple Pay on your Mac

[Learn more about Apple Pay](#)

## Cellular and Wireless

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- **Model A1863\***

FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28, 29, 30, 66)

TD-LTE (Bands 34, 38, 39, 40, 41)

TD-SCDMA 1900 (F), 2000 (A)

CDMA EV-DO Rev. A (800, 1900, 2100 MHz)

UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)

GSM/EDGE (850, 900, 1800, 1900 MHz)

- **Model A1905\***

*Models A1905 and A1897 do not support CDMA networks, such as those used by Verizon and Sprint.*

FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28, 29, 30, 66)

TD-LTE (Bands 34, 38, 39, 40, 41)

UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)

GSM/EDGE (850, 900, 1800, 1900 MHz)

- **All models**

802.11ac Wi-Fi with MIMO

Bluetooth 5.0 wireless technology

NFC with reader mode

Express Cards

## Location

- Assisted GPS, GLONASS, Galileo, and QZSS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>4</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>4</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>5</sup>
- Wi-Fi calling<sup>5</sup>

## Audio Playback

- Audio formats supported: AAC-LC, HE-AAC, HE-AAC v2, Protected AAC, MP3, Linear PCM, Apple Lossless, FLAC, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), and Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+)
- User-configurable maximum volume limit

## Video Playback

- Video formats supported: HEVC, H.264, MPEG-4 Part 2, and Motion JPEG
- Supports Dolby Vision and HDR10 content
- AirPlay Mirroring, photos, and video out to Apple TV (2nd generation or later)<sup>6</sup>
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)<sup>6</sup>

## Siri<sup>7</sup>

- Use your voice to send messages, set reminders, and more
- Get intelligent suggestions on your Lock screen and in Messages, Mail, QuickType, and more
- Activate hands-free with only your voice using “Hey Siri”
- Use your voice to run shortcuts from your favorite apps

[Learn more about Siri](#)

## External Buttons and Connectors

- Home/Touch ID sensor
- Volume up/down

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- Ring/Silent switch
- Side button
- Built-in stereo speaker
- Lightning connector
- Built-in microphone

## Power and Battery<sup>8</sup>

Lasts about the same as iPhone 7

- Talk time (wireless): Up to 14 hours
- Internet use: Up to 12 hours
- Video playback (wireless): Up to 13 hours
- Audio playback (wireless): Up to 40 hours
- Fast-charge capable: Up to 50% charge 30 minutes<sup>9</sup>
- Built-in rechargeable lithium-ion battery
- Wireless charging (works with Qi chargers<sup>10</sup>)
- Charging via USB to computer system or power adapter

## Sensors

- Touch ID fingerprint sensor
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 12

iOS is the world's most personal and secure mobile operating system, packed with powerful features that help you get the most out of every day.

[See what's new in iOS 12](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPhone 8. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can fully enjoy the world's most personal device. [Learn more](#)

Features include:

- Voiceover
- Zoom
- Magnifier
- RTT and TTY support
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps

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- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- News
- Contacts
- Books
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Find My iPhone
- Find My Friends
- Settings
- Files
- Measure

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.*

- iMovie
- Pages
- Keynote
- Numbers
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips
- Shortcuts

## Headphones

- EarPods with Lightning Connector

## SIM Card

- Nano-SIM
- iPhone 8 and iPhone 8 Plus are not compatible with existing micro-SIM cards.

## Rating for Hearing Aids

- iPhone 8 (Model A1863, A1905): M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics; .usdz (USDZ Universal)

## System Requirements

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- Apple ID (required for some features)
- Internet access<sup>11</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X 10.11.6 or later
  - PC: Windows 7 or later
  - iTunes 12.8 or later on Mac and iTunes 12.9 or later on PC (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

### • Language support

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • QuickType keyboard support

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

### • QuickType keyboard support with predictive input

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

### • Siri languages

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

### • Dictation languages

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • Definition dictionary support

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

### • Thesaurus

English (UK, U.S.)

### • Bilingual dictionary support with English

Arabic, Chinese (Simplified, Traditional), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish

### • Spell check

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPhone with iOS 12
- EarPods with Lightning Connector
- Lightning to USB Cable
- USB Power Adapter

- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPhone 8 and iPhone 8 Plus embody Apple's continuing environmental progress. They are designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- Mercury-free LED-backlit display
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Highly recyclable aluminum

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

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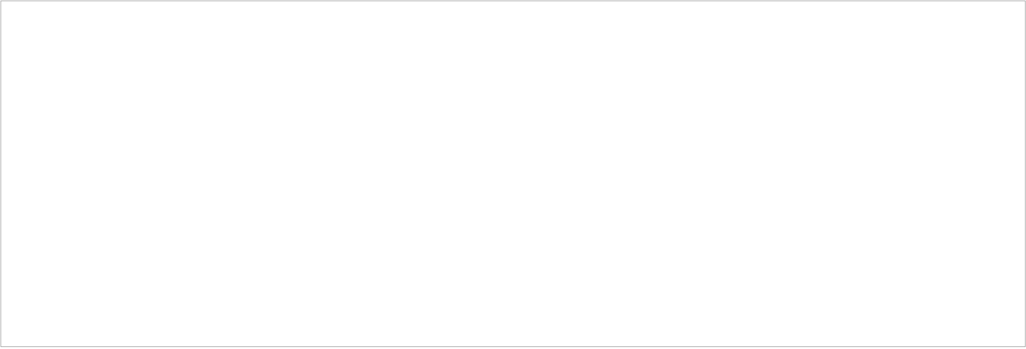
\* To identify your iPhone model number, see <https://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

1. Available space is less and varies due to many factors. A standard configuration uses approximately 10GB to 12GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
2. Size and weight vary by configuration and manufacturing process.
3. iPhone 8 and iPhone 8 Plus are splash, water, and dust resistant and were tested under controlled laboratory conditions with a rating of IP67 under IEC standard 60529 (maximum depth of 1 meter up to 30 minutes). Splash, water, and dust resistance are not permanent conditions and resistance might decrease as a result of normal wear. Do not attempt to charge a wet iPhone; refer to the user guide for cleaning and drying instructions. Liquid damage not covered under warranty.
4. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
5. Data plan required. LTE Advanced, LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
6. Standard Dynamic Range video content only.
7. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
8. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
9. Testing conducted by Apple in August 2017 using preproduction iPhone 8 and iPhone 8 Plus units and software and accessory Apple USB-C Power Adapters (29W Model A1540, 61W Model A1718, 87W Model A1719). Fast-charge testing conducted with drained iPhone units. Charge time varies with environmental factors; actual results will vary.
10. Qi wireless chargers sold separately.
11. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Published Date: Sep 18, 2018

# iPhone 8 Plus - Technical Specifications



## Finish

- Gold
- Silver
- Space Gray
- (PRODUCT)RED™

## Capacity<sup>1</sup>

- 64GB
- 256GB

## Size and Weight<sup>2</sup>

- Height: 6.24 inches (158.4 mm)
- Width: 3.07 inches (78.1 mm)
- Depth: 0.30 inch (7.5 mm)
- Weight: 7.13 ounces (202 grams)

## Display

- Retina HD display
- 5.5-inch (diagonal) widescreen LCD Multi-Touch display with IPS technology
- 1920-by-1080-pixel resolution at 401 ppi
- 1300:1 contrast ratio (typical)
- True Tone display
- Wide color display (P3)
- 3D Touch
- 625 cd/m2 max brightness (typical)
- Dual-domain pixels for wide viewing angles
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously
- Display Zoom
- Reachability

## Splash, Water, and Dust Resistant<sup>3</sup>

- Rated IP67 (maximum depth of 1 meter up to 30 minutes) under IEC standard 60529

## Chip

- A11 Bionic chip
- Neural Engine

## Camera

- Dual 12MP wide-angle and telephoto cameras
- Wide-angle: *f*/1.8 aperture
- Telephoto: *f*/2.8 aperture
- 2x optical zoom; digital zoom up to 10x



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- Portrait mode
- Portrait Lighting
- Optical image stabilization
- Six-element lens
- Quad-LED True Tone flash with Slow Sync
- Panorama (up to 63MP)
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels
- Tap to focus with Focus Pixels
- Live Photos with stabilization
- Wide color capture for photos and Live Photos
- Improved local tone mapping
- Exposure control
- Auto HDR for photos
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging
- Image formats captured: HEIF and JPEG

## Video Recording

- 4K video recording at 24 fps, 30 fps, or 60 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Optical image stabilization for video
- 2x optical zoom; digital zoom up to 6x (iPhone 8 Plus only)
- Quad-LED True Tone flash
- Slo-mo video support for 1080p at 120 fps and 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Take 8MP still photos while recording 4K video
- Playback zoom
- Video geotagging
- Video formats recorded: HEVC and H.264

## FaceTime HD Camera

- 7MP camera
- 1080p HD video recording
- Retina Flash
- $f/2.2$  aperture
- Wide color capture for photos and Live Photos
- Auto HDR for photos
- Backside illumination sensor
- Auto image stabilization
- Burst mode
- Exposure control
- Timer mode

## Touch ID

- Fingerprint sensor built into the Home button

## Apple Pay

- Pay with your iPhone using Touch ID in stores, within apps, and on the web
- Send and receive money in Messages
- Complete purchases made with Apple Pay on your Mac

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1864\***  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28, 29, 30, 66)  
TD-LTE (Bands 34, 38, 39, 40, 41)  
TD-SCDMA 1900 (F), 2000 (A)  
CDMA EV-DO Rev. A (800, 1900, 2100 MHz)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1897\***  
*Models A1905 and A1897 do not support CDMA networks, such as those used by Verizon and Sprint.*  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28, 29, 30, 66)  
TD-LTE (Bands 34, 38, 39, 40, 41)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **All models**  
802.11ac Wi-Fi with MIMO  
Bluetooth 5.0 wireless technology  
NFC with reader mode  
Express Cards

## Location

- Assisted GPS, GLONASS, Galileo, and QZSS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>4</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>4</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>5</sup>
- Wi-Fi calling<sup>5</sup>

## Audio Playback

- Audio formats supported: AAC-LC, HE-AAC, HE-AAC v2, Protected AAC, MP3, Linear PCM, Apple Lossless, FLAC, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), and Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+)
- User-configurable maximum volume limit

## Video Playback

- Video formats supported: HEVC, H.264, MPEG-4 Part 2, and Motion JPEG
- Supports Dolby Vision and HDR10 content
- AirPlay Mirroring, photos, and video out to Apple TV (2nd generation or later)<sup>6</sup>
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)<sup>6</sup>

## Siri<sup>7</sup>

- Use your voice to send messages, set reminders, and more
- Get intelligent suggestions on your Lock screen and in Messages, Mail, QuickType, and more
- Activate hands-free with only your voice using “Hey Siri”
- Use your voice to run shortcuts from your favorite apps

[Learn more about Siri](#)

## External Buttons and Connectors

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- Home/Touch ID sensor
- Volume up/down
- Ring/Silent switch
- Side button
- Built-in stereo speaker
- Lightning connector
- Built-in microphone

## Power and Battery<sup>8</sup>

Lasts about the same as iPhone 7 Plus

- Talk time (wireless): Up to 21 hours
- Internet use: Up to 13 hours
- Video playback (wireless): Up to 14 hours
- Audio playback (wireless): Up to 60 hours
- Fast-charge capable: Up to 50% charge 30 minutes<sup>9</sup>
- Built-in rechargeable lithium-ion battery
- Wireless charging (works with Qi chargers<sup>10</sup>)
- Charging via USB to computer system or power adapter

## Sensors

- Touch ID fingerprint sensor
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 12

iOS is the world's most personal and secure mobile operating system, packed with powerful features that help you get the most out of every day.

[See what's new in iOS 12](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPhone 8. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can fully enjoy the world's most personal device. [Learn more](#)

Features include:

- Voiceover
- Zoom
- Magnifier
- RTT and TTY support
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet

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- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- News
- Contacts
- Books
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Find My iPhone
- Find My Friends
- Settings
- Files
- Measure

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.*

- iMovie
- Pages
- Keynote
- Numbers
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips
- Shortcuts

## Headphones

- EarPods with Lightning Connector

## SIM Card

- Nano-SIM
- iPhone 8 and iPhone 8 Plus are not compatible with existing micro-SIM cards.

## Rating for Hearing Aids

- iPhone 8 Plus (Model A1864, A1897): M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics; .usdz (USDZ Universal)

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>11</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X 10.11.6 or later
  - PC: Windows 7 or later
  - iTunes 12.8 or later on Mac and iTunes 12.9 or later on PC (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

- **Language support**  
English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **QuickType keyboard support**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh
- **QuickType keyboard support with predictive input**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish
- **Siri languages**  
English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)
- **Dictation languages**  
English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **Definition dictionary support**  
English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish
- **Thesaurus**  
English (UK, U.S.)
- **Bilingual dictionary support with English**  
Arabic, Chinese (Simplified, Traditional), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish
- **Spell check**  
English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPhone with iOS 12
- EarPods with Lightning Connector

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- Lightning to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

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- Arsenic-free display glass
- Mercury-free LED-backlit display
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
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### Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

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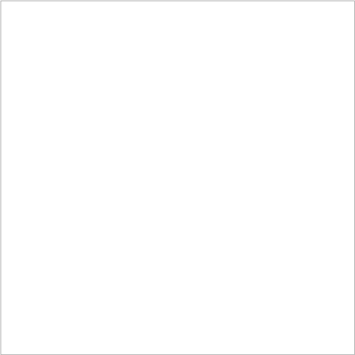
\* To identify your iPhone model number, see <https://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

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2. Size and weight vary by configuration and manufacturing process.
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4. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
5. Data plan required. LTE Advanced, LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
6. Standard Dynamic Range video content only.
7. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
8. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
9. Testing conducted by Apple in August 2017 using preproduction iPhone 8 and iPhone 8 Plus units and software and accessory Apple USB-C Power Adapters (29W Model A1540, 61W Model A1718, 87W Model A1719). Fast-charge testing conducted with drained iPhone units. Charge time varies with environmental factors; actual results will vary.
10. Qi wireless chargers sold separately.
11. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Published Date: Sep 18, 2018

# Apple TV 4K - Technical Specifications



## Size and Weight

### Apple TV 4K

- Height: 1.4 inches (35 mm)
- Width: 3.9 inches (98 mm)
- Depth: 3.9 inches (98 mm)
- Weight: 15 ounces (425 g)<sup>1</sup>

### Siri Remote

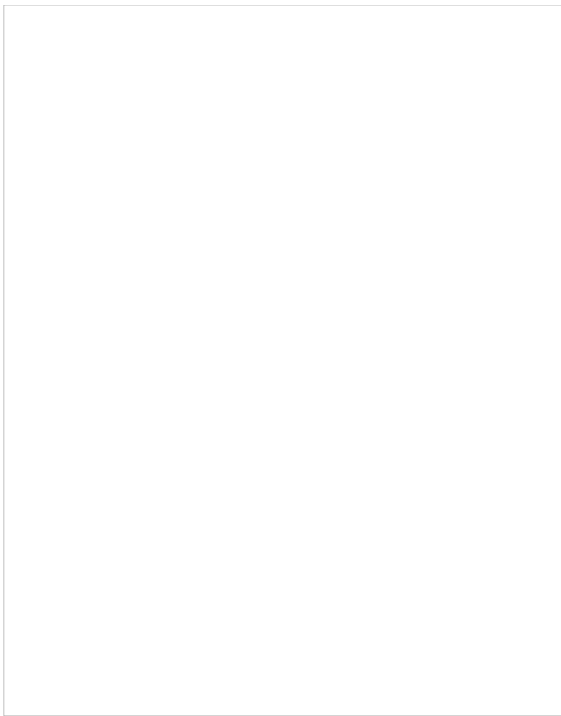
- Height: 4.88 inches (124 mm)
- Width: 1.5 inches (38 mm)
- Depth: 0.25 inch (6.3 mm)
- Weight: 1.59 ounces (45 g)<sup>1</sup>

## Capacity

- 32GB<sup>2</sup>
- 64GB<sup>2</sup>

### Siri Remote

- Bluetooth 4.0 wireless technology
- IR transmitter
- Accelerometer and three-axis gyro
- Lightning connector for charging
- Rechargeable battery providing months of battery life on a single charge (with typical daily usage)
- Charging via USB to computer system or power adapter (sold separately)



## Ports and Interfaces

- HDMI 2.0a<sup>3</sup>
- 802.11ac Wi-Fi with MIMO; simultaneous dual band (2.4GHz and 5GHz)
- Gigabit Ethernet
- Bluetooth 5.0 wireless technology
- IR receiver
- Built-in power supply

## Processor

- A10X Fusion chip with 64-bit architecture

## System Requirements

- iTunes purchasing and renting and Home Sharing require iTunes Store account
- Requires 802.11 wireless, Ethernet network, or Broadband Internet access
- Requires 4K and HDR TV for 4K and HDR streaming
- Requires acceptance of the software license terms at [www.apple.com/legal/sla](http://www.apple.com/legal/sla)
- Requires HDMI cable (sold separately)

## Video Formats

- H.264/HEVC SDR video up to 2160p, 60 fps, Main/Main 10 profile
- HEVC Dolby Vision (Profile 5)/HDR10 (Main 10 profile) up to 2160p
- H.264 Baseline Profile level 3.0 or lower with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats
- MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 fps, Simple profile with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio in .m4v, .mp4, and .mov file formats

## Audio Formats

- HE-AAC (V1), AAC (up to 320 Kbps), protected AAC (from iTunes Store), MP3 (up to 320 Kbps), MP3 VBR, Apple Lossless, FLAC, AIFF, and WAV; AC-3 (Dolby Digital 5.1) and E-AC-3 (Dolby Digital Plus 7.1 surround sound)

## Photo Formats

- HEIF, JPEG, GIF, TIFF

## Compatibility



# 769\_Apple TV 4K - Technical Specifications.pdf

- Apple TV is compatible with HD and UHD TVs with HDMI<sup>3</sup>
- Apple TV is compatible with Bluetooth keyboards<sup>4</sup>

## Accessibility

Accessibility features help people with disabilities get the most out of their Apple TV. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can easily find and enjoy your favorite entertainment. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Closed Caption and SDH Support
- Audio Descriptions
- Siri and Dictation
- Switch Control

## In the Box

- Apple TV 4K
- Siri Remote
- Power cord
- Lightning to USB cable
- Documentation

## Apple TV and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

Apple TV 4K and the Siri Remote are designed with the following features to reduce their environmental impact:

### Apple TV 4K

- BFR-free
- PVC-free<sup>5</sup>
- Meets ENERGY STAR 5.0 requirements

### Siri Remote

- Arsenic-free glass
- BFR-free
- PVC-free<sup>5</sup>
- Recyclable aluminum enclosure

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Apple GiveBack

Ready to let go of your old Apple TV? Just give it to us, and we'll help you recycle it responsibly for free. Good for you. Good for the planet. [Learn more](#) about Apple GiveBack.

- 
1. Weight varies by configuration and manufacturing process.
  2. 1GB = 1 billion bytes; actual formatted capacity less.
  3. Requires HDCP when playing protected content.
  4. Compatible with Magic Keyboard and Apple Wireless Keyboard (2011). Visit <https://support.apple.com/en-us/HT201806> to find out which model you have.
  5. PVC-free worldwide except in India and Thailand, where PVC-free AC power cords are not available.

Services are not available in all countries or regions and are subject to change.

Published Date: Apr 23, 2018

# AirPort Express - Technical Specifications

This article has been archived and is no longer updated by Apple.

## AirPort Express - Technical Specifications

System Requirements	For Macintosh Users	For PC Users
Hardware	A Macintosh computer with an AirPort Extreme Card or AirPort Card	A PC with a Wi-Fi-certified IEEE 802.11b or 802.11g wireless card
Software	<div>Users with Mac OS X v10.3 or later can:<ul style="list-style-type: none"><li>Access an AirPort Express wireless network</li><li>Set up an AirPort Express Base Station</li><li>Use iTunes to play music</li><li>Share a USB printer</li><li>Use Wi-Fi Protected Access (WPA)</li></ul></div> <div>Users with Mac OS X v10.2.7 can:<ul style="list-style-type: none"><li>Access an AirPort wireless network</li><li>Share a USB printer</li></ul></div>	<ul style="list-style-type: none"><li>Windows XP or Windows 2000 <sup>(1)</sup></li><li>WPA support requires a Wi-Fi-certified PC solution</li></ul>
Extended Service and Support	Purchase the <a href="#">AppleCare Protection Plan</a> to extend the service and support for the AirPort Express Base Station.	

### Technical Specifications

#### Wireless protocol

- 802.11g

#### Wireless data rates <sup>(2)</sup>

- Up to 54 Mbps for AirPort Extreme-enabled and other Wi-Fi Certified 802.11g computers (data rate depends on environment)
- Up to 11 Mbps for AirPort-enabled and other Wi-Fi 802.11b-enabled computers (data rate depends on environment)

#### Range <sup>(3)</sup>

- 50-foot range from the base station in typical use at 54 Mbps data rate (range depends on building construction) <sup>(2)</sup>
- 150-foot range from the base station in typical use at 11 Mbps data rate (range depends on building construction)

#### Frequency band

- 2.4GHz

#### Radio output power

- 15dBm

#### Size and weight

- Dimensions: 3.7 inches (94.01mm) x 2.95 inches (75.00mm) x 1.12 inches (28.5mm)
- Weight: 6.7 ounces (189 grams)<sup>(4)</sup>

#### Compatibility

- Interoperable with Wi-Fi Certified for 802.11b and 802.11g computers <sup>(2)</sup>
- Mac computers and Windows-based PCs
- NAT, DHCP, FTP, PPPoE, VPN Passthrough (IPSec, PPTP and L2TP), PPP client and server (AirPort Extreme with modem only), QuickTime Streaming, DNS Proxy, SNMP
- America Online <sup>(5)</sup>

#### Interfaces

- 10/100BASE-T Ethernet WAN port (RJ-45 connector) for connecting a DSL or cable modem
- 3.5mm mini-Audio jack for analog or optical digital sound <sup>(6)</sup>
- USB port for connecting a USB printer<sup>(7)</sup>
- Apple power adapter

#### Security

- Wi-Fi Protected Access™ (WPA) <sup>(8)</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS

#### Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, ARIB STD-T66, RCR STD-T33, AS/NZS 4771:2000, UL 60950, CSA-C22.2 No. 60950

#### Included software

- AirPort Express Assistant to configure the base station for Internet access
- AirPort Admin Utility for base station setup and network administration

#### Electrical and environmental requirements

- 100-240V AC, 50-60Hz, Input Current: 0.2 Amps
- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: -13°to 140° F ( -25° to 60° C)
- Relative humidity (operating): 20% to 90%, noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

#### Channels

- Channels 1-11 approved for use in the United States, Canada, Latin America, and Taiwan
- Channels 1-14 approved for use in Japan
- Channels 1-13 approved for use in other countries

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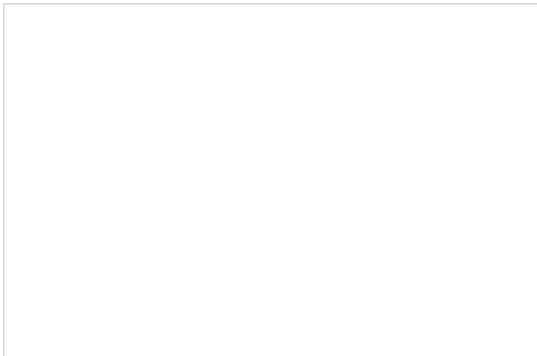
1. AirPort Express Assistant is not compatible with Windows 2000. To setup AirPort Express from a Windows 2000 computer, you must use AirPort Admin Utility for Windows version 4.0 or later.
2. AirPort Express uses the 802.11g wireless standard. Accessing the wireless network requires an AirPort or AirPort Extreme enabled computer or Wi-Fi-certified 802.11b or 802.11g computer. Achieving data rates of 54 Mbps requires that all users have an AirPort Extreme or Wi-Fi-certified 802.11g enabled computer and connect to an AirPort Express Base Station. If a user of a Wi-Fi-certified 802.11b product joins the network, that user will get up to 11 Mbps and AirPort Extreme and Wi-Fi-certified 802.11g users will get less than 54 Mbps. Actual speed will vary based on range, connection rate, site conditions, size of network, and other factors.
3. AirPort Express can extend the range only of an AirPort Express wireless network.
4. Weight varies by configuration and manufacturing process.
5. Compatible with AOL 5.0 or later in the U.S. only. Simultaneous sharing of an AOL connection requires multiple AOL accounts.
6. Requires compatible stereo system or powered speakers.
7. Wireless printing over USB requires Mac OS X v10.2.7 or later or Windows XP or Windows 2000 and a compatible printer.
8. Support for WPA requires Mac OS X v10.3 or later. Use of Wi-Fi Protected Access (WPA) reduces the maximum number of network users. When joining an existing wireless network, AirPort Express only supports WPA-Personal.

Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort Express.

Product specifications are subject to change without notice.

**Published Date: Apr 6, 2016**

# iPhone X - Technical Specifications



## Finish

- Space Gray
- Silver

## Capacity<sup>1</sup>

- 64GB
- 256GB

## Size and Weight<sup>2</sup>

- Height: 5.65 inches (143.6 mm)
- Width: 2.79 inches (70.9 mm)
- Depth: 0.30 inch (7.7 mm)
- Weight: 6.14 ounces (174 grams)

## Display

- Super Retina HD display
- 5.8-inch (diagonal) all-screen OLED Multi-Touch display
- HDR display
- 2436-by-1125-pixel resolution at 458 ppi
- 1,000,000:1 contrast ratio (typical)
- True Tone display
- Wide color display (P3)
- 3D Touch
- 625 cd/m<sup>2</sup> max brightness (typical)
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously

*The iPhone X display has rounded corners that follow a beautiful curved design, and these corners are within a standard rectangle. When measured as a standard rectangular shape, the screen is 5.85 inches diagonally (actual viewable area is less).*

## Splash, Water, and Dust Resistant<sup>3</sup>

- Rated IP67 under IEC standard 60529

## Chip

- A11 Bionic chip with 64-bit architecture
- Neural engine
- Embedded M11 motion coprocessor

## Camera

- 12MP wide-angle and telephoto cameras
- Wide-angle: *f*/1.8 aperture
- Telephoto: *f*/2.4 aperture
- Optical zoom; digital zoom up to 10x

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- Portrait mode
- Portrait Lighting (beta)
- Dual optical image stabilization
- Six-element lens
- Quad-LED True Tone flash with Slow Sync
- Panorama (up to 63MP)
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels
- Tap to focus with Focus Pixels
- Live Photos with stabilization
- Wide color capture for photos and Live Photos
- Improved local tone mapping
- Body and face detection
- Exposure control
- Noise reduction
- Auto HDR for photos
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging
- Image formats captured: HEIF and JPEG

## Video Recording

- 4K video recording at 24 fps, 30 fps, or 60 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Optical image stabilization for video
- Optical zoom; 6x digital zoom
- Quad-LED True Tone flash
- Slo-mo video support for 1080p at 120 fps or 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Body and face detection
- Noise reduction
- Take 8MP still photos while recording 4K video
- Playback zoom
- Video geotagging
- Video formats recorded: HEVC and H.264

## TrueDepth Camera

- 7MP camera
- Portrait mode
- Portrait Lighting (beta)
- Animoji
- 1080p HD video recording
- Retina Flash
- *f*/2.2 aperture
- Wide color capture for photos and Live Photos
- Auto HDR
- Backside illumination sensor
- Body and face detection
- Auto image stabilization
- Burst mode
- Exposure control
- Timer mode

## Face ID

- Enabled by TrueDepth camera for facial recognition

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## Apple Pay

- Pay with your iPhone using Face ID in stores, within apps, and on the web
- Complete purchases made with Apple Pay on your Mac
- Receive and redeem rewards using rewards cards

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1865\***  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28, 29, 30, 66)  
TD-LTE (Bands 34, 38, 39, 40, 41)  
TD-SCDMA 1900 (F), 2000 (A)  
CDMA EV-DO Rev. A (800, 1900, 2100 MHz)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1901\***  
*Model A1901 does not support CDMA networks, such as those used by Verizon and Sprint.*  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28, 29, 30, 66)  
TD-LTE (Bands 34, 38, 39, 40, 41)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **All models**  
802.11ac Wi-Fi with MIMO  
Bluetooth 5.0 wireless technology  
NFC with reader mode

## Location

- Assisted GPS, GLONASS, Galileo, and QZSS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>4</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>4</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>5</sup>
- Wi-Fi calling<sup>5</sup>

## Audio Playback

- Audio formats supported: AAC-LC, HE-AAC, HE-AAC v2, Protected AAC, MP3, Linear PCM, Apple Lossless, FLAC, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), and Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+)
- User-configurable maximum volume limit

## Video Playback

- Video formats supported: HEVC, H.264, MPEG-4 Part 2, and Motion JPEG
- High Dynamic Range with Dolby Vision and HDR10 content
- AirPlay Mirroring, photos, and video out to Apple TV (2nd generation or later)<sup>6</sup>
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)<sup>6</sup>

## Siri<sup>7</sup>

- Use your voice to send messages, set reminders, and more
- Get intelligent suggestions in Messages, Mail, QuickType, and more

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- Activate with only your voice using “Hey Siri”
- Listen and identify songs

[Learn more about Siri](#)

## External Buttons and Connectors

- Volume up/down
- Ring/Silent switch
- Side button
- Built-in stereo speaker
- Built-in microphone
- Lightning connector

## Power and Battery<sup>8</sup>

- Lasts up to 2 hours longer than iPhone 7
- Talk time (wireless): Up to 21 hours
- Internet use: Up to 12 hours
- Video playback (wireless): Up to 13 hours
- Audio playback (wireless): Up to 60 hours
- Fast-charge capable: Up to 50% charge 30 minutes<sup>9</sup>
- Built-in rechargeable lithium-ion battery
- Wireless charging (works with Qi-certified chargers<sup>10</sup>)
- Charging via USB to computer system or power adapter

## Sensors

- Face ID
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 11

With new features and capabilities that let you get more done quickly and easily, iOS 11 makes iPhone more powerful, personal, and intelligent than ever.

[See what's new in iOS 11](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPhone X. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can fully enjoy the world's most personal device. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Software TTY
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health

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- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- News
- Contacts
- iBooks
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Find My iPhone
- Find My Friends
- Settings
- Files

## Free Apps from Apple

Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.

- iMovie
- Pages
- Numbers
- Keynote
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips

## Headphones

- EarPods with Lightning Connector

## SIM Card

- Nano-SIM
- iPhone X is not compatible with existing micro-SIM cards.

## Rating for Hearing Aids

- iPhone X (Model A1865, A1901): M3, T4

## Mail Attachment Support



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- **Viewable document types**

.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>11</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X 10.10.5 or later
  - PC: Windows 7 or later
  - iTunes 12.7 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

- **Language support**

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **QuickType keyboard support**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

- **QuickType keyboard support with predictive input**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

- **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

- **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

- **Bilingual dictionary support**

Chinese (Simplified), Dutch, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish

- **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

# 770\_iPhone X - Technical Specifications.pdf

- iPhone with iOS 11
- EarPods with Lightning Connector
- Lightning to 3.5 mm Headphone Jack Adapter
- Lightning to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPhone X embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Mercury-free
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Highly recyclable stainless steel

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

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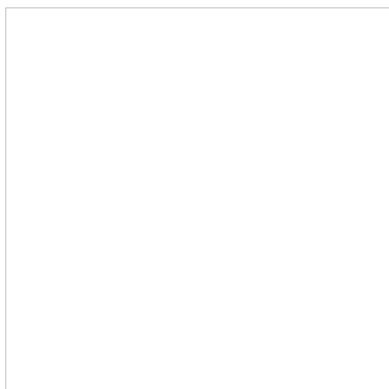
\* To identify your iPhone model number, see <https://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

1. Available space is less and varies due to many factors. A standard configuration uses approximately 8GB to 11GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
2. Size and weight vary by configuration and manufacturing process.
3. iPhone X is splash, water, and dust resistant and was tested under controlled laboratory conditions with a rating of IP67 under IEC standard 60529. Splash, water, and dust resistance are not permanent conditions and resistance might decrease as a result of normal wear. Do not attempt to charge a wet iPhone; refer to the user guide for cleaning and drying instructions. Liquid damage not covered under warranty.
4. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
5. Data plan required. LTE Advanced, LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
6. Standard Dynamic Range video content only.
7. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
8. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
9. Testing conducted by Apple in August 2017 using preproduction iPhone X units and software and accessory Apple USB-C Power Adapters (29W Model A1540, 61W Model A1718, 87W Model A1719). Fast-charge testing conducted with drained iPhone units. Charge time varies with environmental factors; actual results will vary.
10. Compatible Qi-certified wireless chargers sold separately.
11. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

Published Date: Sep 12, 2018

# iMac Pro (2017)- Technical Specifications



## Display

- 27-inch (diagonal) Retina 5K display
- 5120-by-2880 resolution with support for one billion colors
- 500 nits brightness
- Wide color (P3)

## Processor

- **8-Core**  
3.2GHz Intel Xeon W  
Turbo Boost up to 4.2GHz  
19MB cache

*Configurable to:*

- **10-Core**  
3.0GHz Intel Xeon W  
Turbo Boost up to 4.5GHz  
23.75MB cache
- **14-Core**  
2.5GHz Intel Xeon W  
Turbo Boost up to 4.3GHz  
33.25MB cache
- **18-Core**  
2.3GHz Intel Xeon W  
Turbo Boost up to 4.3GHz  
42.75MB cache

## Graphics

- **Vega 56**  
Radeon Pro Vega 56 graphics processor  
with 8GB of HBM2 memory  
56 compute units  
3584 stream processors  
9 teraflops single precision  
18 teraflops half precision

*Configurable to:*

- **Vega 64**  
Radeon Pro Vega 64 graphics processor  
with 16GB of HBM2 memory  
64 compute units  
4096 stream processors  
11 teraflops single precision  
22 teraflops half precision

## Memory

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- **32GB**  
32GB of 2666MHz DDR4 ECC memory  
Quad-channel memory controller

*Configurable to:*

- **64GB**  
64GB of 2666MHz DDR4 ECC memory
- **128GB**  
128GB of 2666MHz DDR4 ECC memory

## Storage<sup>1</sup>

- 1TB SSD

*Configurable to:*

- 2TB SSD
- 4TB SSD

## Video Support and Camera

- 1080p FaceTime HD camera
- Simultaneously supports full native resolution on the built-in display at 1 billion colors and:
  - Two 5120-by-2880 (5K) external displays at 60Hz with support for 1 billion colors, or
  - Four 3840-by-2160 (4K UHD) external displays at 60Hz with support for 1 billion colors, or
  - Four 4096-by-2304 (4K) external displays at 60Hz with support for millions of colors
- Support for extended desktop and video mirroring modes
- Thunderbolt 3 digital video output
- Native DisplayPort output over USB-C
- Thunderbolt 2, HDMI, DVI, and VGA output supported using adapters (sold separately)

## Audio

- Stereo speakers
- Four microphones
- 3.5 mm headphone jack

## Connections and Expansion

- Nbase-T Ethernet with support for 1Gb, 2.5Gb, 5Gb, and 10Gb Ethernet using RJ-45 connector
- SDXC card slot with support for UHS-II
- Four USB 3 ports
- Four Thunderbolt 3 (USB-C) ports with support for:
  - DisplayPort 1.2
  - Thunderbolt (up to 40 Gbps)
  - USB 3.1 Gen 2 (up to 10 Gbps)
  - Thunderbolt 2, HDMI, DVI, and VGA supported using adapters (sold separately)

## Input

- Space Gray Magic Keyboard with Numeric Keypad
- Space Gray Magic Mouse 2
- Optional Space Gray Magic Trackpad 2

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking  
IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 4.2 wireless technology

## Size and Weight

- Height: 20.3 inches (51.6 cm)

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- Width: 25.6 inches (65.0 cm)
- Stand depth: 8 inches (20.3 cm)
- Weight: 21.5 pounds (9.7 kg)<sup>2</sup>

## Electrical and Operating Requirements

- Line voltage: 100–240V AC
- Frequency: 50Hz to 60Hz, single phase
- Operating temperature: 50° to 95° F (10° to 35° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 16,400 feet (5000 meters)

## In the Box

- iMac Pro
- Space Gray Magic Keyboard with Numeric Keypad
- Space Gray Magic Mouse 2
- Lightning to USB Cable
- Power cord

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iMac Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>3</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes

- iBooks
- App Store
- Time Machine

iMac Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iMac Pro is designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- Mercury-free LED-backlit display
- Brominated flame retardant-free
- PVC-free<sup>4</sup>
- Beryllium-free
- Recyclable aluminum enclosure
- Speaker, keyboard, and trackpad enclosures made with post-consumer recycled plastic
- Fan assembly made with 26 percent bio-based plastic
- 100 percent of packaging fibers are sourced from responsibly managed forests or recycled paper

Apple and the Environment

[Learn more](#) about Apple’s dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it’s in good shape, you can trade it in for Apple Store credit. If it’s not eligible for credit, we’ll recycle it responsibly at no cost to you. Good for you. Good for the planet. [See how it works](#)

Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	2.1 ( $K_v=0.3$ )	13
Wireless web	2.1 ( $K_v=0.3$ )	13

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WAd}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 3.2GHz 8-core Intel Xeon W processor, 32GB memory, 1TB storage, Radeon Pro Vega 56 Graphics.

- 
1. 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Weight varies by configuration and manufacturing process.
  3. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  4. PVC-free AC power cord available in all regions except India and South Korea.

# Aperture 3 - Technical Specifications

## System Requirements

### Minimum

One of the following Intel-based Mac computers with Intel Core 2 Duo, Core i3, Core i5, Core i7, or Xeon processor:

- Mac Pro
- MacBook Pro
- MacBook
- MacBook Air
- iMac
- Mac mini

Operating system:

- Mac OS X v10.9 (or later)

Memory:

- 2GB of RAM
- 4GB of RAM required for Mac Pro

Other requirements:

- 1GB of disk space for application and documentation

### Recommended

- Mac computer with an Intel i3 processor (or faster)
- 4GB of RAM
- Mac OS X v10.9 (or later)

## File Formats

Native RAW import and editing of images from leading digital cameras and camera backs (See RAW support page for model listing.)

- .ARW, .CR2, .CRW, .MOS, .NEF, .RAF, .RAW, .SRW, .TIF, .OLY, .FFF, .3FR, .DNG<sup>1</sup>

Compatible with all major still image formats

- JPEG, GIF, TIFF, PNG, PDF, PSD<sup>2</sup>

## Input/Output

- Import images directly from cameras and storage devices
  - CompactFlash I, II, and Microdrive
  - Memory Stick and Memory Stick Duo
  - Secure Digital, MultiMedia, and SmartMedia cards
  - xD Picture cards
- Import from multiple cards simultaneously
- Drag files in from any volume (preserves Finder folder hierarchy)
- Browse and import directly from iPhoto library
- Capture images directly from tethered Nikon or Canon cameras<sup>3</sup>

## Wide Support for RAW Formats from Leading Cameras

Aperture 3 supports the RAW formats from more than 150 digital cameras and camera backs. Aperture also lets you work with most DNG files.<sup>4</sup>  
Shoot JPEG? Using Aperture, you can import JPEG images from virtually all digital cameras.

### Canon

- EOS 1D
- EOS 1D Mark II

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- EOS 1D Mark IIN
- EOS 1D Mark III
- EOS 1Ds
- EOS 1Ds Mark II
- EOS 1Ds Mark III\*
- EOS 1D Mark IV\*
- EOS-1D C\*\*\*
- EOS-1D X\*\*
- EOS 5D
- EOS 5D Mark II\*
- EOS 5D Mark III\*\*
- EOS 5DS R\*\*\*\*
- EOS 5DS\*\*\*\*
- EOS 6D\*\*\*
- EOS 7D
- EOS 7D Mark II\*\*\*\*
- EOS 10D
- EOS 20D
- EOS 30D
- EOS 40D
- EOS 50D\*
- EOS 60D\*\*
- EOS 70D\*\*\*
- EOS 500D\*
- EOS D30
- EOS D60
- EOS Digital Rebel XS/Kiss Digital F2/1000D\*
- EOS Digital Rebel/Kiss Digital/300D
- EOS Digital Rebel XT/Kiss Digital N/350D
- EOS Digital Rebel XTi/Kiss Digital X/400D
- EOS Digital Rebel XSi/Kiss Digital X2/450D
- EOS Kiss Digital X3\*
- EOS Rebel SL1 / 100D / Kiss X7\*\*\*
- EOS Rebel T1i\*
- EOS Rebel T2i EF-S / 550D / Kiss X4\*\*
- EOS Rebel T3 / 1100D / Kiss X50\*\*
- EOS Rebel T3i / 600D / Kiss X5\*\*
- EOS Rebel T4i / 650D / Kiss X6i\*\*
- EOS Rebel T5i / 700D / Kiss X7i\*\*\*
- EOS Rebel T5 / 1200D / Kiss X70\*\*\*
- EOS Rebel T6i / 750D / Kiss X8i\*\*\*\*
- EOS Rebel T6s / 760D / Kiss 8000D\*\*\*\*
- EOS M\*\*\*
- EOS M2\*\*\*
- EOS M3\*\*\*\*
- EOS M10\*\*\*\*
- PowerShot G3 X\*\*\*\*
- PowerShot G5
- PowerShot G5 X\*\*\*\*
- PowerShot G6
- PowerShot G7 X\*\*\*\*
- PowerShot G9\*
- PowerShot G9 X\*\*\*\*
- PowerShot G10\*
- PowerShot G11\*
- PowerShot G12\*\*
- PowerShot G15\*\*\*
- PowerShot G16\*\*\*
- PowerShot G1 X\*\*
- PowerShot G1 X Mark II\*\*\*
- PowerShot Pro 1
- PowerShot S60
- PowerShot S70
- PowerShot S90\*\*
- PowerShot S95\*\*



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- PowerShot S100\*\*
- PowerShot S110\*\*\*
- PowerShot S120\*\*\*
- PowerShot SX1 IS\*\*
- PowerShot SX50 HS\*\*\*
- PowerShot SX60 HS\*\*\*\*
- sRAW\*\*
- mRAW\*\*

## DxO

- DxO One\*\*\*\*

## Epson

- R-D1
- R-D1x\*

## Fujifilm

- FinePix S2 Pro
- FinePix S3 Pro
- FinePix S5 Pro
- FinePix X100\*\*
- X-A2\*\*\*\*
- X-Pro1 \*\*\*
- X-A1 \*\*\*
- X-E1 \*\*\*
- X-E2\*\*\*
- X-E2S\*\*\*\*
- X-M1\*\*\*
- X-T1\*\*\*
- X-T10\*\*\*\*
- XQ1\*\*\*\*
- XQ2\*\*\*\*
- X20\*\*\*
- X30\*\*\*\*
- X70\*\*\*\*
- X100S\*\*\*
- X100T\*\*\*\*

## Hasselblad

- CF-22\*
- CF-39\*
- CFV-16\*
- H3D-31\*
- H3D-31II\*
- H3DII-50\*\*
- H4D-40\*\*
- Hasselblad CFV-50c\*\*\*\*
- Hasselblad H5D-50c\*\*\*\*
- Lunar\*\*\*

## Kodak

- DCS Pro SLR/n\*

## Konica Minolta

- DiMAGE A1
- DiMAGE A2
- DiMAGE A200\*\*
- Maxxum 5D
- Maxxum 7D

## Leaf

# 772\_Aperture 3 - Technical Specifications.pdf

- AFi 5
- AFi 6
- AFi 7
- AFi-II 6\*
- AFi-II 7\*
- Aptus 17
- Aptus 22
- Aptus 54S\*
- Aptus 65
- Aptus 65S\*
- Aptus 75
- Aptus 75S\*
- Aptus-II 6\*
- Aptus-II 7\*
- Valeo 22
- Valeo 17
- Valeo 11

## Leica

- Digilux 2
- Digilux 3
- C (Typ 112)\*\*\*\*
- M\*\*\*
- M8
- M8.2\*
- M9\*\*
- M Monochrom\*\*\*
- M Monochrom (Typ 246)\*\*\*\*
- S2\*\*
- X1\*\*
- D-LUX 2
- D-LUX 3
- D-LUX 4\*\*
- D-Lux 5\*\*
- D-Lux 6\*\*\*
- D-Lux (Typ 109)\*\*\*\*
- Q (Typ 116)\*\*\*\*
- S (Typ 007)\*\*\*\*
- SL (Typ 601)\*\*\*\*
- V-LUX 1
- V-Lux 2\*\*
- V-Lux 4\*\*\*
- V-Lux (Typ 114)\*\*\*\*
- X2\*\*\*
- X-U (Typ 113)\*\*\*\*
- X (Typ 113)\*\*\*\*
- X Vario (Typ 107)\*\*\*\*

## Nikon

- 1 AW1\*\*\*
- 1 J5\*\*\*\*
- 1 S2\*\*\*\*
- 1 V3\*\*\*
- D1
- D1X
- D1H
- D2H
- D2Hs
- D2X
- D2Xs
- D3\*
- D3s\*
- D3X\*
- D4\*\*

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- D4S\*\*\*
- D5\*\*\*\*
- D40
- D40x
- D50
- D60\*
- D70
- D70s
- D80
- D90\*
- D100
- D200
- D300\*
- D300s
- D500\*\*\*\*
- D600\*\*\*
- D610\*\*\*
- D700\*
- D750\*\*\*\*
- D800\*\*
- D800E\*\*
- D810\*\*\*
- D810A\*\*\*\*
- D3000
- D3100\*\*
- D3200\*\*
- D3300\*\*\*
- D5000\*
- D5100\*\*
- D5200\*\*\*
- D5300\*\*\*
- D5500\*\*\*\*
- D7000\*\*
- D7100\*\*\*
- D7200\*\*\*\*
- Df\*\*\*
- COOLPIX 8800
- COOLPIX 8700
- COOLPIX 8400
- COOLPIX P6000
- COOLPIX A\*\*\*
- COOLPIX P330\*\*\*
- COOLPIX P340\*\*\*
- COOLPIX P7000\*\*
- COOLPIX P7100\*\*
- COOLPIX P7700\*\*\*
- COOLPIX P7800\*\*\*
- Nikon 1 J1\*\*
- Nikon 1 J2\*\*\*
- Nikon 1 J3\*\*\*
- Nikon 1 J4\*\*\*\*
- Nikon 1 S1\*\*\*
- Nikon 1 V1\*\*
- Nikon 1 V2\*\*\*

### Olympus

- E-1
- E-3\*
- E-5\*\*
- E-30\*
- E-450\*\*
- E-600\*\*
- E-620\*\*
- E-P1\*\*

## 772\_Aperture 3 - Technical Specifications.pdf

- E-P2\*\*
- E-P3\*\*
- E-PL1\*\*
- E-PL2\*\*
- EVOLT E-300
- EVOLT E-330
- EVOLT E-400
- EVOLT E-410
- EVOLT E-420\*
- EVOLT E-500
- EVOLT E-510
- EVOLT E-520\*
- C-8080 Wide Zoom
- C-7070
- C-7000
- OM-D E-M1\*\*\*
- OM-D E-M5\*\*
- OM-D E-M5 Mark II\*\*\*\*
- OM-D E-M10\*\*\*
- OM-D E-M10 Mark II\*\*\*\*
- PEN E-P5\*\*\*
- PEN E-PL1s\*\*
- PEN E-PL3\*\*
- PEN E-PL5\*\*\*
- PEN E-PM1\*\*
- PEN E-PM2\*\*\*
- PEN Lite E-PL6\*\*\*
- PEN Lite E-PL7\*\*\*\*
- SP-570 UZ\*
- STYLUS 1\*\*\*
- STYLUS SH-2\*\*\*\*
- STYLUS TG-4 Tough\*\*\*\*
- STYLUS XZ-2\*\*\*
- XZ-1\*\*

### Panasonic

- DMC-LC1
- LUMIX CM1\*\*\*\*
- LUMIX DMC-FZ50
- LUMIX DMC-FZ70\*\*\*\*
- LUMIX DMC-FZ72\*\*\*\*
- LUMIX DMC-FZ100\*\*
- LUMIX DMC-FZ150\*\*
- LUMIX DMC-FZ200\*\*\*
- LUMIX DMC-FZ300 / DMC-FZ330\*\*\*\*
- LUMIX DMC-FZ1000\*\*\*
- LUMIX DMC-G1\*\*
- LUMIX DMC-G2\*\*
- LUMIX DMC-G3\*\*
- LUMIX DMC-G5\*\*\*
- LUMIX DMC-G6\*\*\*
- LUMIX DMC-G7\*\*\*\*
- LUMIX DMC-G10\*\*
- LUMIX DMC-GF1\*\*
- LUMIX DMC-GF2\*\*
- LUMIX DMC-GF3\*\*
- LUMIX DMC-GF5\*\*
- LUMIX DMC-GF6\*\*\*
- LUMIX DMC-GF7\*\*\*\*
- LUMIX DMC-GH1\*\*
- LUMIX DMC-GH2\*\*
- LUMIX DMC-GH3\*\*\*
- LUMIX DMC-GH4\*\*\*
- LUMIX DMC-GM5\*\*\*\*

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- LUMIX DMC-GM1\*\*\*
- LUMIX DMC-GX1\*\*
- LUMIX DMC-GX8\*\*\*\*
- LUMIX DMC-FZ35\*\*
- LUMIX DMC-FZ38\*\*
- LUMIX DMC-L1
- LUMIX DMC-LX1
- LUMIX DMC-LX100\*\*\*\*
- LUMIX DMC-LX2
- LUMIX DMC-LX3\*\*
- LUMIX DMC-LX5\*\*
- LUMIX DMC-LX7\*\*\*
- LUMIX DMC-TZ60\*\*\*\*
- LUMIX DMC-TZ61\*\*\*\*
- LUMIX DMC-TZ70\*\*\*\*
- LUMIX DMC-TZ71\*\*\*\*
- LUMIX DMC-ZS40\*\*\*\*
- LUMIX DMC-ZS50\*\*\*\*
- LUMIX DMC-ZS60 / DMC-TZ80\*\*\*\*

### Pentax

- 645D\*\*\*
- 645Z\*\*\*\*
- \*ist D
- \*ist DL
- \*ist DL2\*
- \*ist DS
- \*ist DS2\*
- K-r\*\*
- K-x\*\*
- K-3\*\*\*
- K-3 II\*\*\*\*
- K-5\*\*
- K-5 II\*\*\*
- K-5 IIs\*\*\*
- K-7\*\*
- K-30\*\*\*
- K-S1\*\*\*\*
- K-S2\*\*\*\*
- K10D
- K20D
- K100D
- K100D Super\*
- K110D
- K200D
- K2000/K-m\*
- MX-1\*\*\*\*
- Pentax Q\*\*\*

### Samsung

- GX-1L
- GX-1S\*\*
- GX-10\*
- GX-20\*
- NX10\*\*
- NX11\*\*
- NX100\*\*
- NX200\*\*

### Sony

- A7R Mark II\*\*\*\*
- Alpha 7\*\*\*
- Alpha 7R\*\*\*

## 772\_Aperture 3 - Technical Specifications.pdf

- Alpha DSLR-A230\*\*
- Alpha DSLR-A330\*\*
- Alpha DSLR-A380\*\*
- Alpha DSLR-A390\*\*
- Alpha DSLR-A450\*\*
- Alpha DSLR-A500\*\*
- Alpha DSLR-A550\*\*
- Alpha DSLR-A850\*\*
- Alpha ILCE-3000\*\*\*
- Alpha ILCE-7S\*\*\*
- Alpha ILCE-7S II\*\*\*\*
- Alpha ILCE-5000\*\*\*
- Alpha ILCE-5100\*\*\*\*
- Alpha ILCE-6000\*\*\*
- Alpha ILCE-6300\*\*\*\*
- Alpha ILCE-7M2\*\*\*\*
- Alpha NEX-3\*\*
- Alpha NEX-5\*\*
- Alpha NEX-C3\*\*
- Alpha NEX-3N\*\*\*
- Alpha NEX-5N\*\*
- Alpha NEX-5R\*\*\*
- Alpha NEX-5T\*\*\*
- Alpha NEX-6\*\*\*
- Alpha NEX-7\*\*
- Alpha NEX-F3\*\*\*
- Alpha SLT-A37\*\*
- Alpha SLT-A57\*\*
- Alpha SLT-A58\*\*\*
- Alpha SLT-A65\*\*
- Alpha SLT-A68\*\*\*\*
- Alpha SLT-A77\*\*
- Alpha SLT-A77 II\*\*\*
- Alpha SLT-A99\*\*\*
- Cyber-shot DSC-RX100\*\*\*
- Cyber-shot DSC-RX100 II\*\*\*
- Cyber-shot DSC-RX100 III\*\*\*
- Cyber-shot DSC-RX1R\*\*\*
- Cyber-shot DSC-RX1R II\*\*\*\*
- Cyber-shot DSC-RX10\*\*\*
- DSC-F828
- DSC-R1\*
- DSC-RX1\*\*\*
- DSC-V3
- DSLR-A100
- DSLR-A200\*
- DSLR-A290\*\*
- DSLR-A300\*
- DSLR-A350\*
- DSLR-A560\*\*
- DSLR-A580\*\*
- DSLR-A700\*
- DSLR-A900\*
- NEX-VG20\*\*
- RX10 Mark II\*\*\*\*
- RX100 Mark IV\*\*\*\*
- SLT-A33\*\*
- SLT-A35\*\*
- SLT-A55\*\*

- 
1. DNG files must be generated by the Adobe DNG Converter with the “Convert to Linear Image” option turned off.
  2. Aperture maintains but does not display layer and alpha channel information in PSD files.
  3. Tethering requires compliance with standard protocols that are not supported by all camera models.
  4. Aperture works with most DNG files generated from cameras that support this format and with DNG files generated by the Adobe DNG

# 772\_Aperture 3 - Technical Specifications.pdf

Converter with the “Convert to Linear Image” option turned off.

## **RAW Support Requirements**

Aperture 1.5 or later with Mac OS X v10.4.11 Tiger or Mac OS X v10.5 Leopard or later.

\* Requires Aperture 2 or later with Mac OS X v10.4.11 Tiger or Mac OS X v10.5.2 Leopard or later.

\*\* Requires Aperture 3 or later.

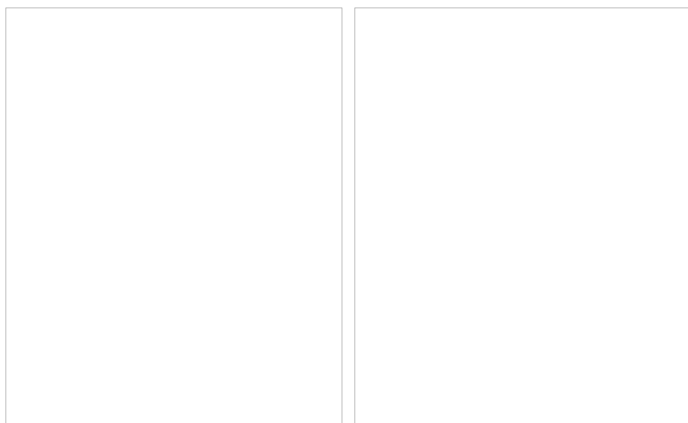
\*\*\* Requires Aperture 3.4 or later.

\*\*\*\* Requires OS X Yosemite and Photos or other supported imaging applications.

\*\*\*\*\* Nikon RAW L format only.

Published Date: Jan 2, 2018

# HomePod - Technical Specifications



## Size, Weight, and Color

- **Dimensions:**  
6.8 inches high (172 mm)  
5.6 inches wide (142 mm)
- **Weight:**  
5.5 pounds (2.5 kg)
- **Color:**  
Space Gray  
White

## Audio Technology

- High-excursion woofer with custom amplifier
- Array of seven horn-loaded tweeters, each with its own custom amplifier
- Six-microphone array for far-field Siri
- Internal low-frequency calibration microphone for automatic bass correction
- Direct and ambient audio beamforming
- Transparent studio-level dynamic processing
- Stereo pair capable

## Audio Sources

- Apple Music<sup>1</sup>
- iTunes music purchases
- iCloud Music Library with an Apple Music or iTunes Match subscription
- Beats 1 live radio
- Beats 1 live episodes on demand
- Apple Podcasts
- AirPlay other content to HomePod from iPhone, iPad, iPod touch, Apple TV, or Mac

## Audio Formats

- HE-AAC (V1), AAC (16 to 320 Kbps), protected AAC (from iTunes Store), MP3 (16 to 320 Kbps), MP3 VBR, Apple Lossless, AIFF, WAV, and FLAC<sup>2</sup>

## Touch Surface

- Tap or hold + or – for volume up/down
- Touch and hold for Siri
- Tap to play/pause music or Siri
- Double-tap to skip
- Triple-tap to skip back

## Accessibility

Accessibility features help people with disabilities get the most out of HomePod.

[Learn more](#)



# 773\_HomePod - Technical Specifications.pdf

Features include:

- Touch Accommodations
- Siri
- VoiceOver
- Home app and HomeKit

## Wireless

- 802.11ac Wi-Fi with MIMO
- Direct guest access<sup>3</sup>
- Bluetooth 5.0
- Multiroom speaker support with AirPlay 2<sup>4</sup>

## System Requirements

- iPhone 5s or later, iPad Pro, iPad (5th generation or later), iPad Air or later, iPad mini 2 or later, or iPod touch (6th generation) with iOS 11.4 or later
- 802.11 Wi-Fi Internet access
- Apple Music subscription for full music functionality<sup>1</sup>

## Electrical and Environmental Requirements

- Built-in power supply
- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 32° to 95° F (0° to 35° C)
- Storage temperature: −4° to 113° F (−20° to 45° C)
- Relative humidity: 5% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)
- Maximum storage altitude: 15,000 feet (4500 m)
- Maximum shipping altitude: 35,000 feet (10,500 m)

## In the Box

- HomePod
- Documentation

## Compatibility

### iPhone:

- iPhone X
- iPhone 8 Plus
- iPhone 8
- iPhone 7 Plus
- iPhone 7
- iPhone 6s Plus
- iPhone 6s
- iPhone 6 Plus
- iPhone 6
- iPhone SE
- iPhone 5s

### iPad:

- 12.9-inch iPad Pro
- 10.5-inch iPad Pro
- 9.7-inch iPad Pro
- iPad (6th generation)
- iPad (5th generation)
- iPad Air 2
- iPad Air
- iPad mini 4
- iPad mini 3
- iPad mini 2

## iPod touch:

- iPod touch (6th generation)

## HomePod and the Environment

Apple takes a complete product life cycle approach to determining the effect we have on the planet. [Learn more](#)

HomePod embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Meets ENERGY STAR for Audio/Video Version 3.0 requirements

## Apple and the Environment

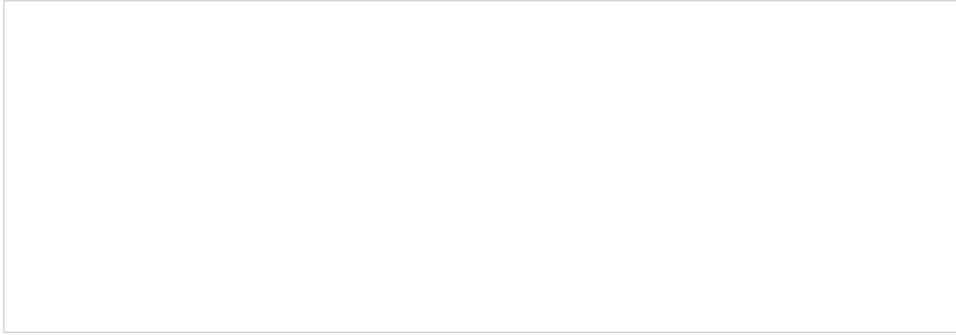
[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

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1. Apple Music requires subscription.
2. AirPlay is used to stream content on iPhone to HomePod. Transcoding to a lossy format for streaming may occur.
3. Peer-to-peer AirPlay requires a Mac (2012 or later) with OS X Yosemite or later, or an iOS device (late 2012 or later) with iOS 8 or later.
4. Requires multiple HomePod devices or AirPlay 2-compatible speakers.

Published Date: Jun 26, 2018

# iPad (6th generation) - Technical Specifications



## Finish

- Silver
- Gold
- Space Gray

## Capacity<sup>1</sup>

- Wi-Fi
  - 32GB
  - 128GB
- Wi-Fi + Cellular
  - 32GB
  - 128GB

## Size and Weight<sup>2</sup>

- Wi-Fi
  - Height: 9.4 inches (240 mm)
  - Width: 6.6 inches (169.5 mm)
  - Depth: 0.29 inch (7.5 mm)
  - Weight: 1.03 pounds (469 g)
- Wi-Fi + Cellular
  - Height: 9.4 inches (240 mm)
  - Width: 6.6 inches (169.5 mm)
  - Depth: 0.29 inch (7.5 mm)
  - Weight: 1.05 pounds (478 g)

## Buttons and Connectors

- Home/Touch ID sensor
- Built-in stereo speakers
- Lightning connector
- 3.5 mm headphone jack
- On/Off - Sleep/Wake
- Volume up/down
- Nano-SIM tray (cellular models)

## Connector

- Lightning

## In the Box

- iPad
- Lightning to USB Cable
- USB Power Adapter

## Display

# 774\_iPad (6th generation) - Technical Specifications.pdf

- Retina display
- 9.7-inch (diagonal) LED-backlit Multi-Touch display with IPS technology
- 2048-by-1536-pixel resolution at 264 ppi
- Fingerprint-resistant oleophobic coating
- Supports Apple Pencil

## Chip

- A10 Fusion chip with 64-bit architecture
- Embedded M10 coprocessor

## Camera

- 8-megapixel camera
- Live Photos
- Autofocus
- Panorama (up to 43 megapixels)
- HDR for photos
- Exposure control
- Burst mode
- Tap to focus
- Timer mode
- *f*/2.4 aperture
- Five-element lens
- Hybrid IR filter
- Backside illumination
- Auto image stabilization
- Body and face detection
- Photo geotagging

## Video Recording

- 1080p HD video recording
- Slo-mo (120 fps)
- Time-lapse video with stabilization
- Video image stabilization
- Body and face detection
- 3x video zoom
- Video geotagging

## FaceTime HD Camera

- 1.2-megapixel photos
- Live Photos
- *f*/2.2 aperture
- Retina Flash
- 720p HD video recording
- Backside illumination
- HDR for photos and videos
- Body and face detection
- Burst mode
- Exposure control
- Timer mode

## Video Calling<sup>3</sup>

- Wi-Fi
  - FaceTime video
  - iPad to any FaceTime-enabled device over Wi-Fi
- Wi-Fi + Cellular
  - FaceTime video
  - iPad to any FaceTime-enabled device over Wi-Fi or cellular

## Audio Calling<sup>3</sup>

# 774\_iPad (6th generation) - Technical Specifications.pdf

- Wi-Fi
  - FaceTime audio
  - iPad to any FaceTime-enabled device over Wi-Fi
- Wi-Fi + Cellular
  - FaceTime audio
  - iPad to any FaceTime-enabled device over Wi-Fi or cellular

## Cellular and Wireless

- **Wi-Fi model**  
Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO  
Bluetooth 4.2 technology
- **Wi-Fi + Cellular model**  
Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz); HT80 with MIMO  
Bluetooth 4.2 technology  
UMTS/HSPA/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz); GSM/EDGE (850, 900, 1800, 1900 MHz)  
CDMA EV-DO Rev. A (800, 1900 MHz)  
LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28, 29, 30, 38, 39, 40, 41)<sup>4</sup>  
Data only<sup>5</sup>  
Wi-Fi calling<sup>4</sup>

## SIM Card

- **Wi-Fi + Cellular model**  
Nano-SIM (supports Apple SIM)  
Includes Apple SIM  
[Learn more about Apple SIM](#)

## Location

- Wi-Fi
  - Digital compass
  - Wi-Fi
  - iBeacon microlocation
- Wi-Fi + Cellular model
  - Digital compass
  - Wi-Fi
  - Assisted GPS and GLONASS
  - Cellular
  - iBeacon microlocation

## Sensors

- Touch ID
- Three-axis gyro
- Accelerometer
- Barometer
- Ambient light sensor

## Touch ID

- Fingerprint identity sensor built into the Home button

## Apple Pay

- Pay with your iPad using Touch ID within apps and on the web
- Send and receive money in Messages

[Learn more about Apple Pay](#)

## Siri<sup>6</sup>

- Use your voice to send messages, set reminders, and more
- Use hands-free
- Listen and identify songs

# 774\_iPad (6th generation) - Technical Specifications.pdf

[Learn more about Siri](#)

## Power and Battery<sup>7</sup>

- Wi-Fi
  - Built-in 32.4-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Charging via power adapter or USB to computer system
- Wi-Fi + Cellular model
  - Built-in 32.4-watt-hour rechargeable lithium-polymer battery
  - Up to 10 hours of surfing the web on Wi-Fi, watching video, or listening to music
  - Up to 9 hours of surfing the web using cellular data network
  - Charging via power adapter or USB to computer system

## Operating System

### iOS 12

iOS is the world's most personal and secure mobile operating system, packed with powerful features that help you get the most out of every day.

[See what's new in iOS 12](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPad. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- Siri and Dictation
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Messages
- FaceTime
- Mail
- Music
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- Voice Memos
- Contacts
- Books
- Home
- Reminders
- Stocks
- Clock
- TV
- News
- Photo Booth
- Podcasts
- Measure
- Find My iPhone
- Find My Friends

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- Files

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled on iPad.*

- Pages
- Numbers
- Keynote
- iMovie
- GarageBand
- iTunes U
- Apple Store
- Trailers
- Remote
- Music Memos
- Clips
- Swift Playgrounds
- Shortcuts

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>8</sup>

Syncing with iTunes on a Mac or PC requires:

- Mac: OS X 10.10.5 or later
- PC: Windows 7 or later
- iTunes 12.7.3 or later (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Languages

- **Language support**  
English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese
- **QuickType keyboard support**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh
- **QuickType keyboard support with predictive input**  
English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish
- **Siri languages**  
English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)
- **Dictation languages**  
English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

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- **Definition dictionary support**  
English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish
- **Thesaurus**  
English (UK, U.S.)
- **Bilingual dictionary support**  
Arabic, Chinese (Simplified), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish
- **Spell check**  
English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## Audio Playback

- Audio formats supported: AAC (8 to 320 Kbps), Protected AAC (from iTunes Store), HE-AAC, MP3 (8 to 320 Kbps), MP3 VBR, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+), Apple Lossless, AIFF, and WAV
- User-configurable maximum volume limit

## TV and Video

- AirPlay Mirroring, photos, audio, and video out to Apple TV (2nd generation or later)
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)
- Video formats supported: H.264 video up to 4K, 30 frames per second, High Profile level 4.2 with AAC-LC audio up to 160 Kbps, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; MPEG-4 video up to 2.5 Mbps, 640 by 480 pixels, 30 frames per second, Simple Profile with AAC-LC audio up to 160 Kbps per channel, 48kHz, stereo audio or Dolby Audio up to 1008 Kbps, 48kHz, stereo or multichannel audio, in .m4v, .mp4, and .mov file formats; Motion JPEG (M-JPEG) up to 35 Mbps, 1280 by 720 pixels, 30 frames per second, audio in ulaw, PCM stereo audio in .avi file format

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

- 
1. Available space is less and varies due to many factors. A standard configuration uses approximately 10GB to 12GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
  2. Size and weight vary by configuration and manufacturing process.
  3. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
  4. Data plan required. LTE and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/ipad/LTE](http://www.apple.com/ipad/LTE).
  5. Cellular data plan is sold separately. The model you purchase is configured to work with a particular cellular network technology. Check with your carrier for compatibility and cellular data plan availability.
  6. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
  7. Testing conducted by Apple in March 2018 using preproduction iPad (6th generation) units and software. Testing consisted of full battery discharge while performing each of the following tasks: video playback, audio playback, and Internet browsing using Wi-Fi or cellular data network. Video content was a repeated 2-hour 23-minute movie purchased from the iTunes Store. Audio content was a playlist of 358 unique audio tracks purchased from the iTunes Store. Internet over Wi-Fi and cellular data network tests were conducted using dedicated web and mail servers, browsing snapshot versions of 20 popular web pages, and receiving mail once an hour. All settings were default except: Wi-Fi was associated with a network (except for Internet browsing over cellular data network); the Wi-Fi feature Ask to Join Networks and Auto-Brightness were turned off; Brightness was set to 50%; and WPA2 encryption was enabled. Battery life depends on device settings, usage, and many other factors. Battery tests are conducted using specific iPad units; actual results may vary.
  8. Wireless broadband recommended; fees may apply.

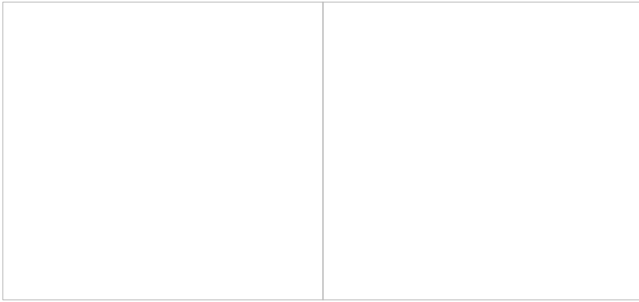


# 774\_iPad (6th generation) - Technical Specifications.pdf

Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: Sep 18, 2018

# MacBook Pro (13-inch, 2018, Four Thunderbolt 3 Ports) - Technical Specifications



## Touch Bar

- Touch Bar with integrated Touch ID sensor

## Finish

- Silver
- Space Gray

## Display

- Retina display
- 13.3-inch (diagonal) LED-backlit display with IPS technology; 2560-by-1600 native resolution at 227 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 1680 by 1050
  - 1440 by 900
  - 1024 by 640
- 500 nits brightness
- Wide color (P3)
- True Tone technology

## Processor

- 2.3GHz quad-core Intel Core i5, Turbo Boost up to 3.8GHz, with 128MB of eDRAM  
*Configurable to 2.7GHz quad-core Intel Core i7, Turbo Boost up to 4.5GHz, with 128MB of eDRAM*

## Storage<sup>1</sup>

- **256GB**  
256GB SSD  
*Configurable to 512GB, 1TB, or 2TB SSD*
- **512GB**  
512GB SSD  
*Configurable to 1TB or 2TB SSD*

## Memory

- 8GB of 2133MHz LPDDR3 onboard memory  
*Configurable to 16GB of memory*

## Graphics

- Intel Iris Plus Graphics 655

## Charging and Expansion

Four Thunderbolt 3 (USB-C) ports with support for:

- Charging

# 775\_MacBook Pro (13-inch, 2018, Four Thunderbolt 3 Ports) - Technical Specifications.pdf

- DisplayPort
- Thunderbolt (up to 40 Gbps)
- USB 3.1 Gen 2 (up to 10 Gbps)

## Keyboard and Trackpad

- **Full-size backlit keyboard with:**
  - 64 (U.S.) or 65 (ISO) keys including 4 arrow keys
  - Touch Bar with integrated Touch ID sensor
  - Ambient light sensor
  - Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 5.0 wireless technology

## Camera

- 720p FaceTime HD camera

## Video Support

Simultaneously supports full native resolution on the built-in display at millions of colors and:

- One display with 5120-by-2880 resolution at 60Hz at over a billion colors
- Up to two displays with 4096-by-2304 resolution at 60Hz at millions of colors
- Up to two displays with 3840-by-2160 resolution at 60Hz at over a billion colors

Thunderbolt 3 digital video output

- Native DisplayPort output over USB-C
- VGA, HDMI, and Thunderbolt 2 output supported using adapters (sold separately)

## Audio

- Stereo speakers with high dynamic range
- Two microphones
- 3.5 mm headphone jack

## Battery and Power<sup>2</sup>

- Up to 10 hours wireless web
- Up to 10 hours iTunes movie playback
- Up to 30 days of standby time
- Built-in 58.0-watt-hour lithium-polymer battery
- 61W USB-C Power Adapter

## Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and Weight

- Height: 0.59 inch (1.49 cm)
- Width: 11.97 inches (30.41 cm)

# 775\_MacBook Pro (13-inch, 2018, Four Thunderbolt 3 Ports) - Technical Specifications.pdf

- Depth: 8.36 inches (21.24 cm)
- Weight: 3.02 pounds (1.37 kg)<sup>3</sup>

## Operating System

### macOS High Sierra

macOS is the operating system that powers everything you do on a Mac. macOS High Sierra brings new forward-looking technologies and enhanced features to your Mac. It's macOS at its highest level yet.

[Learn more](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new MacBook Pro. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can create and do amazing things.

[Learn more](#)

Features include:

- VoiceOver
- Zoom
- Increase Contrast
- Reduce Motion
- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## What's in the Box

- 13-inch MacBook Pro
- 61W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Configure to Order

Configure your MacBook Pro with these options, only at [apple.com](https://apple.com):

- 2.7GHz quad-core Intel Core i7, Turbo Boost up to 4.5GHz, with 128MB of eDRAM
- 16GB of 2133MHz LPDDR3 memory
- 512GB, 1TB, or 2TB SSD

## MacBook Pro and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

MacBook Pro is designed with the following features to reduce its environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- BFR-free
- PVC-free<sup>5</sup>
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
- Rated EPEAT Gold<sup>6</sup>

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Apple GiveBack

Letting go of your old Mac is easy with Apple GiveBack. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

## Accessories

- Mac Software
- Final Cut Pro X
- Logic Pro X

## Displays and Adapters

- LG UltraFine 4K Display
- LG UltraFine 5K Display
- Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter
- USB-C to USB Adapter
- USB-C Digital AV Multiport Adapter
- USB-C VGA Multiport Adapter
- USB-C to Gigabit Ethernet Adapter

## Other Accessories

- USB-C to Lightning Cable
- USB-C Charge Cable
- 61W USB-C Power Adapter
- Magic Keyboard
- Magic Keyboard with Numeric Keypad
- Magic Trackpad 2
- Magic Mouse 2
- AppleCare+ for Mac

## Acoustic Performance

Declared noise emission values in accordance with ECMA-109

	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.3 ( $K_V=0.3$ )	4
Wireless web	1.3 ( $K_V=0.3$ )	4

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)

# 775\_MacBook Pro (13-inch, 2018, Four Thunderbolt 3 Ports) - Technical Specifications.pdf

4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
  5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
  6. The Wireless web test browses 25 popular websites.
  7. Configuration tested: 2.3GHz quad-core Intel Core i5 processor, 8GB memory, 512GB storage, Intel Iris Plus Graphics 655.
- 

1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
2. Testing conducted by Apple in June 2018 using preproduction 2.3GHz quad-core Intel Core i5-based 13-inch MacBook Pro systems with 8GB of RAM and 512GB SSD; and preproduction 2.6GHz 6-core Intel Core i7-based 15-inch MacBook Pro systems with 16GB of RAM and 512GB SSD. Testing conducted by Apple in May 2017 using preproduction 2.3GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with 8GB of RAM and 1TB SSD. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
3. Weight varies by configuration and manufacturing process.
4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
5. PVC-free AC power cord available in all regions except India and South Korea.
6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Jul 13, 2018

# MacBook Pro (15-inch, 2018) - Technical Specifications



## Touch Bar

- Touch Bar with integrated Touch ID sensor

## Finish

- Silver
- Space Gray

## Display

- Retina display
- 15.4-inch (diagonal) LED-backlit display with IPS technology; 2880-by-1800 native resolution at 220 pixels per inch with support for millions of colors
- Supported scaled resolutions:
  - 1920 by 1200
  - 1680 by 1050
  - 1280 by 800
  - 1024 by 640
- 500 nits brightness
- Wide color (P3)
- True Tone technology

## Processor

- **2.2GHz**  
2.2GHz 6-core Intel Core i7, Turbo Boost up to 4.1GHz, with 9MB shared L3 cache  
*Configurable to 2.9GHz 6-core Intel Core i9, Turbo Boost up to 4.8GHz, with 12MB shared L3 cache*
- **2.6GHz**  
2.6GHz 6-core Intel Core i7, Turbo Boost up to 4.3GHz, with 9MB shared L3 cache  
*Configurable to 2.9GHz 6-core Intel Core i9, Turbo Boost up to 4.8GHz, with 12MB shared L3 cache*

## Storage<sup>1</sup>

- **256GB**  
256GB SSD  
*Configurable to 512GB, 1TB, 2TB, or 4TB SSD*
- **512GB**  
512GB SSD  
*Configurable to 1TB, 2TB, or 4TB SSD*

## Memory

- 16GB of 2400MHz DDR4 onboard memory  
*Configurable to 32GB of memory*

## Graphics

- **2.2GHz**  
Radeon Pro 555X with 4GB of GDDR5 memory and automatic graphics switching  
Intel UHD Graphics 630  
*Configurable to Radeon Pro 560X with 4GB of GDDR5 memory*

# 776\_MacBook Pro (15-inch, 2018) - Technical Specifications.pdf

- **2.8GHz**

Radeon Pro 560X with 4GB of GDDR5 memory and automatic graphics switching  
Intel UHD Graphics 630

## Charging and Expansion

Four Thunderbolt 3 (USB-C) ports with support for:

- Charging
- DisplayPort
- Thunderbolt (up to 40 Gbps)
- USB 3.1 Gen 2 (up to 10 Gbps)

## Keyboard and Trackpad

- **Full-size backlit keyboard with:**
  - 64 (U.S.) or 65 (ISO) keys including 4 arrow keys
  - Touch Bar with integrated Touch ID sensor
  - Ambient light sensor
  - Force Touch trackpad for precise cursor control and pressure-sensing capabilities; enables Force clicks, accelerators, pressure-sensitive drawing, and Multi-Touch gestures

## Wireless

- **Wi-Fi**  
802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible
- **Bluetooth**  
Bluetooth 5.0 wireless technology

## Camera

- 720p FaceTime HD camera

## Video Support

Simultaneously supports full native resolution on the built-in display at millions of colors and:

- Up to two displays with 5120-by-2880 resolution at 60Hz at over a billion colors
- Up to four displays with 4096-by-2304 resolution at 60Hz at over a billion colors

Thunderbolt 3 digital video output

- Native DisplayPort output over USB-C
- VGA, HDMI, and Thunderbolt 2 output supported using adapters (sold separately)

## Audio

- Stereo speakers with high dynamic range
- Three microphones
- 3.5 mm headphone jack

## Battery and Power<sup>2</sup>

- Up to 10 hours wireless web
- Up to 10 hours iTunes movie playback
- Up to 30 days of standby time
- Built-in 83.6-watt-hour lithium-polymer battery
- 87W USB-C Power Adapter

## Operating Requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing



# 776\_MacBook Pro (15-inch, 2018) - Technical Specifications.pdf

- Operating altitude: tested up to 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Size and Weight

- Height: 0.61 inch (1.55 cm)
- Width: 13.75 inches (34.93 cm)
- Depth: 9.48 inches (24.07 cm)
- Weight: 4.02 pounds (1.83 kg)<sup>3</sup>

## Operating System

### macOS High Sierra

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[Learn more](#)

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Features include:

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- Siri and Dictation
- Switch Control
- Closed Captions
- Text to Speech

## Built-in Apps<sup>4</sup>

- Photos
- iMovie
- GarageBand
- Pages
- Numbers
- Keynote
- Siri
- Safari
- Mail
- FaceTime
- Messages
- Maps
- Notes
- Calendar
- Contacts
- Reminders
- Photo Booth
- Preview
- iTunes
- iBooks
- App Store
- Time Machine

## What's in the Box

- 15-inch MacBook Pro
- 87W USB-C Power Adapter
- USB-C Charge Cable (2 m)

## Configure to Order

Configure your MacBook Pro with these options, only at [apple.com](https://apple.com):

- 2.9GHz 6-core Intel Core i9, Turbo Boost up to 4.8GHz, with 12MB shared L3 cache
- 32GB of 2400MHz DDR4 memory
- Radeon Pro 560X with 4GB of GDDR5 memory
- 512GB, 1TB, 2TB, or 4TB SSD

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- PVC-free<sup>5</sup>
- Beryllium-free
- Highly recyclable aluminum enclosure
- Meets ENERGY STAR 6.1 requirements
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## Accessories

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- Logic Pro X

### Displays and Adapters

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- LG UltraFine 5K Display
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- Magic Trackpad 2
- Magic Mouse 2
- AppleCare+ for Mac

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Declared noise emission values in accordance with ECMA-109

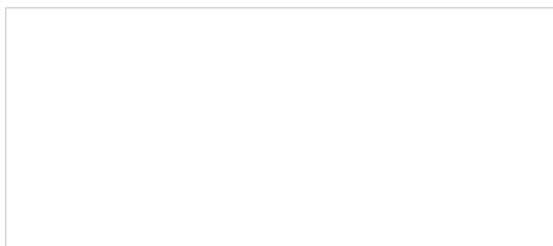
	Sound Power Level $L_{WA,m}$ (B)	Sound Pressure Level Operator Position $L_{pA,m}$ (dB)
Idle	1.7 ( $K_v=0.3$ )	9.0
Wireless web	1.7 ( $K_v=0.3$ )	9.0

1.  $L_{WA,m}$  is the mean A-weighted sound power level, rounded to the nearest 0.1 B.
2.  $L_{pA,m}$  is the mean A-weighted sound pressure level measured at operator position (rounded to the nearest 1 dB).
3. 1 B (bel) = 10 dB (decibel)
4.  $K_v$  is the statistical adder for computing upper-limit of A-weighted sound power level.
5. The quantity,  $L_{WA,c}$  (formerly called  $L_{WA,d}$ ) may be computed from the sum of  $L_{WA,m}$  and  $K_v$ .
6. The Wireless web test browses 25 popular websites.
7. Configuration tested: 2.6GHz 6-core Intel Core i7 processor, 16GB memory, 512 GB storage, Radeon Pro 560X with 4GB of GDDR5 memory.

- 
1. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
  2. Testing conducted by Apple in June 2018 using preproduction 2.3GHz quad-core Intel Core i5-based 13-inch MacBook Pro systems with 8GB of RAM and 512GB SSD; and preproduction 2.6GHz 6-core Intel Core i7-based 15-inch MacBook Pro systems with 16GB of RAM and 512GB SSD. Testing conducted by Apple in May 2017 using preproduction 2.3GHz dual-core Intel Core i5-based 13-inch MacBook Pro systems with 8GB of RAM and 1TB SSD. The wireless web test measures battery life by wirelessly browsing 25 popular websites with display brightness set to 12 clicks from bottom or 75%. The iTunes movie playback test measures battery life by playing back HD 1080p content with display brightness set to 12 clicks from bottom or 75%. The standby test measures battery life by allowing a system, connected to a wireless network and signed in to an iCloud account, to enter standby mode with Safari and Mail applications launched and all system settings left at default. Battery life varies by use and configuration. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.
  3. Weight varies by configuration and manufacturing process.
  4. iMovie, GarageBand, Pages, Numbers, and Keynote are available on the Mac App Store. Downloading apps requires an Apple ID and a device that is compatible with the OS version required for each app.
  5. PVC-free AC power cord available in all regions except India and South Korea.
  6. MacBook Pro achieved a Gold rating from EPEAT in the U.S. and Canada.

Published Date: Jul 13, 2018

# Apple Watch Series 4 - Technical Specifications



## Finishes

### GPS + Cellular

- **Stainless Steel**
  - Silver
  - Space Gray
  - Gold
- **Aluminum**
  - Silver
  - Space Gray
  - Gold

### GPS

- **Aluminum**
  - Silver
  - Space Gray
  - Gold

Apple Watch Nike+ available in silver and space gray aluminum.

Apple Watch Hermès available in polished stainless steel.

## Features

- GPS, GLONASS, Galileo, and QZSS
- Barometric altimeter
- Water resistant
  - 50 meters<sup>1</sup>*
- Electrical heart sensor
- Optical heart sensor
- Improved accelerometer
  - up to 32 g-forces*
- Improved gyroscope
- Ambient light sensor
- Capacity 16GB
- All ceramic and sapphire crystal back

## Display

- **44mm**
  - 368 by 448 pixels
  - 977 sq mm display area
- **40mm**
  - 324 by 394 pixels
  - 759 sq mm display area
- **LTPO OLED Retina display with Force Touch**
  - 1000 nits brightness

## Chip

- **S4 with 64-bit dual-core processor**
  - Up to 2x faster processor*
- **W3**

*Apple wireless chip*

## Connectivity

- **LTE and UMTS<sup>2</sup>**  
GPS + Cellular models  
[Learn more about available carriers](#)
- **Wi-Fi**  
802.11b/g/n 2.4GHz
- **Bluetooth 5.0**

## Power

- Built-in rechargeable lithium-ion battery  
*Up to 18 hours<sup>3</sup>*
- Magnetic charging cable
- USB power adapter

## Case Size

### Stainless Steel - 40mm

- Height: 40mm
- Width: 34mm
- Depth: 10.7mm
- Case Weight: 39.8g

### Stainless Steel - 44mm

- Height: 44mm
- Width: 38mm
- Depth: 10.7mm
- Case Weight: 47.9g

### Aluminum - 40mm

- Height: 40mm
- Width: 34mm
- Depth: 10.7mm
- Case Weight: 30.1g

### Aluminum - 44mm

- Height: 44mm
- Width: 38mm
- Depth: 10.7mm
- Case Weight: 36.7g

- 
1. Apple Watch Series 3 and Series 4 have a water resistance rating of 50 meters under ISO standard 22810:2010. This means that they may be used for shallow-water activities like swimming in a pool or ocean. However, they should not be used for scuba diving, waterskiing, or other activities involving high-velocity water or submersion below shallow depth.
  2. Wireless service plan required for cellular service. Apple Watch and iPhone service provider must be the same. Not all service providers support enterprise accounts; check with your employer and service provider. Roaming is not available outside your carrier network coverage area. Contact your service provider for more details. Check [www.apple.com/watch/cellular](http://www.apple.com/watch/cellular) for participating wireless carriers and eligibility.
  3. Apple Watch All-Day Battery Life testing was conducted by Apple in August 2018 using preproduction Apple Watch Series 4 (GPS) and Apple Watch Series 4 (GPS + Cellular), each paired with an iPhone; all devices were tested with prerelease software. Battery life varies by use, cellular coverage, configuration, and many other factors; actual results will vary. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/watch/battery.html](http://www.apple.com/watch/battery.html) for more information.

Apple Watch Series 4 (GPS + Cellular) requires an iPhone 6 or later with iOS 12 or later. Apple Watch Series 4 (GPS) requires an iPhone 5s or later with iOS 12 or later.

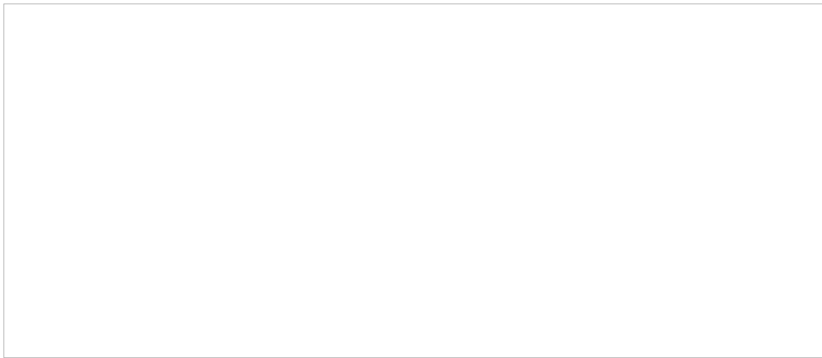
Features are subject to change. Some features, applications, and services may not be available in all regions or all languages. [Click here](#) to see complete list.

Apple Watch Series 4 (GPS + Cellular) has not been authorized as required by the rules of the Federal Communications Commission. Apple Watch Series 4 (GPS + Cellular) is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.

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Published Date: Sep 18, 2018

# iPhone Xs - Technical Specifications



## Finish

- Gold
- Space Gray
- Silver

## Capacity<sup>1</sup>

- 64GB
- 256GB
- 512GB

## Size and Weight<sup>2</sup>

- Width: 2.79 inches (70.9 mm)
- Height: 5.65 inches (143.6 mm)
- Depth: 0.30 inch (7.7 mm)
- Weight: 6.24 ounces (177 grams)

## Display

- Super Retina HD display
- 5.8-inch (diagonal) all-screen OLED Multi-Touch display
- HDR display
- 2436-by-1125-pixel resolution at 458 ppi
- 1,000,000:1 contrast ratio (typical)
- True Tone display
- Wide color display (P3)
- 3D Touch
- 625 cd/m<sup>2</sup> max brightness (typical)
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously

*The iPhone Xs display has rounded corners that follow a beautiful curved design, and these corners are within a standard rectangle. When measured as a standard rectangular shape, the screen is 5.85 inches diagonally (actual viewable area is less).*

## Splash, Water, and Dust Resistant<sup>3</sup>

- Rated IP68 (maximum depth of 2 meters up to 30 minutes) under IEC standard 60529

## Chip

- A12 Bionic chip
- Next-generation Neural Engine

## Camera

- Dual 12MP wide-angle and telephoto cameras
- Wide-angle: *f*/1.8 aperture
- Telephoto: *f*/2.4 aperture

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- 2x optical zoom; digital zoom up to 10x
- Portrait mode with advanced bokeh and Depth Control
- Portrait Lighting with five effects (Natural, Studio, Contour, Stage, Stage Mono)
- Dual optical image stabilization
- Six-element lens
- Quad-LED True Tone flash with Slow Sync
- Panorama (up to 63MP)
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels
- Tap to focus with Focus Pixels
- Smart HDR for photos
- Wide color capture for photos and Live Photos
- Local tone mapping
- Advanced red-eye correction
- Exposure control
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging
- Image formats captured: HEIF and JPEG

## Video Recording

- 4K video recording at 24 fps, 30 fps, or 60 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Extended dynamic range for video up to 30 fps
- Optical image stabilization for video
- 2x optical zoom; digital zoom up to 6x
- Quad-LED True Tone flash
- Slo-mo video support for 1080p at 120 fps or 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Take 8MP still photos while recording 4K video
- Playback zoom
- Video geotagging
- Video formats recorded: HEVC and H.264
- Stereo recording

## TrueDepth Camera

- 7MP camera
- $f/2.2$  aperture
- Portrait mode with advanced bokeh and Depth Control
- Portrait Lighting with five effects (Natural, Studio, Contour, Stage, Stage Mono)
- Animoji and Memoji
- 1080p HD video recording at 30 fps or 60 fps
- Smart HDR for photos
- Extended dynamic range for video at 30 fps
- Cinematic video stabilization (1080p and 720p)
- Wide color capture for photos and Live Photos
- Retina Flash
- Backside illumination sensor
- Auto image stabilization
- Burst mode
- Exposure control
- Timer mode

## Face ID

- Enabled by TrueDepth camera for facial recognition



## Apple Pay

- Pay with your iPhone using Face ID in stores, within apps, and on the web
- Send and receive money in Messages
- Complete purchases made with Apple Pay on your Mac

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1920\***  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 29, 30, 32, 66, 71)  
TD-LTE (Bands 34, 38, 39, 40, 41, 46)  
CDMA EV-DO Rev. A (800, 1900 MHz)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1921\***  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 29, 30, 32, 66, 71)  
TD-LTE (Bands 34, 38, 39, 40, 41, 46)  
CDMA EV-DO Rev. A (800, 1900 MHz)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **All models**  
Gigabit-class LTE with 4x4 MIMO and LAA4  
802.11ac Wi-Fi with 2x2 MIMO  
Bluetooth 5.0 wireless technology  
NFC with reader mode

## Location

- Assisted GPS, GLONASS, Galileo, and QZSS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>5</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>5</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>4</sup>
- Wi-Fi calling<sup>4</sup>

## Audio Playback

- Audio formats supported: AAC-LC, HE-AAC, HE-AAC v2, Protected AAC, MP3, Linear PCM, Apple Lossless, FLAC, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), and Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+)
- Wider stereo playback
- User-configurable maximum volume limit

## Video Playback

- Video formats supported: HEVC, H.264, MPEG-4 Part 2, and Motion JPEG
- High Dynamic Range with Dolby Vision and HDR10 content
- AirPlay Mirroring, photos, and video out to Apple TV (2nd generation or later)<sup>6</sup>
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)<sup>6</sup>

## Siri<sup>7</sup>

- Use your voice to send messages, set reminders, and more

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- Get intelligent suggestions on your Lock screen and in Messages, Mail, QuickType, and more
- Activate hands-free with only your voice using “Hey Siri”
- Use your voice to run shortcuts from your favorite apps

[Learn more about Siri](#)

## External Buttons and Connectors

- Volume up/down
- Ring/Silent
- Side button
- Built-in stereo speaker
- Lightning connector
- Built-in microphone

## Power and Battery<sup>8</sup>

- Lasts up to 30 minutes longer than iPhone X
- Talk time (wireless): Up to 20 hours
- Internet use: Up to 12 hours
- Video playback (wireless): Up to 14 hours
- Audio playback (wireless): Up to 60 hours
- Fast-charge capable: Up to 50% charge 30 minutes<sup>9</sup>
- Built-in rechargeable lithium-ion battery
- Wireless charging (works with Qi chargers<sup>10</sup>)
- Charging via USB to computer system or power adapter

## Sensors

- Face ID
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 12

iOS is the world’s most personal and secure mobile operating system, packed with powerful features that help you get the most out of every day.

[See what’s new in iOS 12](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPhone Xs. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can fully enjoy the world’s most personal device. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- RTT and TTY support
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health

- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- News
- Contacts
- Books
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Find My iPhone
- Find My Friends
- Settings
- Files
- Measure

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.*

- iMovie
- Pages
- Keynote
- Numbers
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips
- Shortcuts

## Headphones

- EarPods with Lightning Connector

## SIM Card

- Dual SIM (nano-SIM and eSIM)<sup>11</sup>
- iPhone Xs and iPhone Xs Max are not compatible with existing micro-SIM cards.

## Rating for Hearing Aids

- M3, T4

## Mail Attachment Support

- **Viewable document types**

.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics; .usdz (USDZ Universal)

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>12</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X 10.11.6 or later
  - PC: Windows 7 or later
  - iTunes 12.8 or later on Mac and iTunes 12.9 or later on PC (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

- **Language support**

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **QuickType keyboard support**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

- **QuickType keyboard support with predictive input**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

- **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

- **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

- **Thesaurus**

English (UK, U.S.)

- **Bilingual dictionary support with English**

Arabic, Chinese (Simplified, Traditional), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish

- **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPhone with iOS 12
- EarPods with Lightning Connector
- Lightning to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPhone Xs and iPhone Xs Max embody Apple's continuing environmental progress. They are designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- Mercury-free display
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Recyclable stainless steel

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet. [See how it works](#)

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\* To identify your iPhone model number, see <https://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

1. Available space is less and varies due to many factors. A standard configuration uses approximately 10GB to 12GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
2. Size and weight vary by configuration and manufacturing process.
3. iPhone Xs and iPhone Xs Max are splash, water, and dust resistant and were tested under controlled laboratory conditions with a rating of IP68 under IEC standard 60529 (maximum depth of 2 meters up to 30 minutes). Splash, water, and dust resistance are not permanent conditions and resistance might decrease as a result of normal wear. Do not attempt to charge a wet iPhone; refer to the user guide for cleaning and drying instructions. Liquid damage not covered under warranty.
4. Data plan required. Gigabit-class LTE, LTE Advanced, LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
5. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
6. Standard Dynamic Range video content only.
7. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
8. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
9. Testing conducted by Apple in August 2018 using preproduction iPhone Xs and iPhone Xs Max units and software and accessory Apple USB-C Power Adapters (30W Model A1882 and 87W Model A1719). Fast-charge testing conducted with drained iPhone units. Charge time varies with environmental factors; actual results will vary.
10. Qi wireless chargers sold separately.
11. eSIM will be available later this year through a software update. Use of eSIM requires a wireless service plan (which may include restrictions on switching service providers and roaming, even after contract expiration). Not all carriers support eSIM. Use of eSIM in iPhone may be disabled when purchased from some carriers. See your carrier for details. To learn more, visit <https://support.apple.com/kb/HT209044>.
12. Wireless broadband recommended; fees may apply.

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Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: Sep 14, 2018

# Apple Cinema HD Display (23") - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Apple Cinema HD Display (23") - Technical Specifications

Configurations			
Model	Apple Studio Display M7649ZM/B	Apple Cinema Display M8893ZM/A	Apple Cinema HD Display M8537ZM/A
Screen size and type	17-inch (viewable) active-matrix LCD	20-inch (viewable) active-matrix LCD	23-inch (viewable) active-matrix LCD
Maximum resolution	1280 by 1024 pixels	1680 by 1050 pixels	1920 by 1200 pixels
Viewing angle	170° horizontal; 170° vertical	170° horizontal; 170° vertical	170° horizontal; 170° vertical
Color support	16.7 million colors	16.7 million colors	16.7 million colors
Input/Output ports	Apple Display Connector; two-port, self-powered USB hub	Apple Display Connector; two-port, self-powered USB hub	Apple Display Connector; two-port, self-powered USB hub
Agency approvals	ENERGY STAR, TCO 95	ENERGY STAR, TCO 95	ENERGY STAR, TCO 95

System Requirements
<ul style="list-style-type: none"><li>■ The Apple Studio Display requires Mac OS X v10.1.3 or Mac OS 9.2.2 or later, and one of the following systems:<ul style="list-style-type: none"><li>—Power Mac G4 with an Apple Display Connector</li><li>—PowerBook G4 with a DVI port and an Apple DVI to ADC Adapter</li></ul></li><li>■ The Apple Cinema Display requires Mac OS X v10.2 or later, and one of the following systems:<ul style="list-style-type: none"><li>—Power Mac G4 with an NVIDIA GeForce2 MX, GeForce3, GeForce4 MX, or GeForce4 Titanium graphics card; or with an ATI Radeon 7500, 9000 Pro, or 9700 Pro graphics card</li><li>—PowerBook G4 with a DVI port and an Apple DVI to ADC Adapter</li></ul></li><li>■ The Apple Cinema HD Display requires Mac OS X v10.1.3 or Mac OS 9.2.2 or later, and one of the following systems:<ul style="list-style-type: none"><li>—Power Mac G4 with an NVIDIA GeForce2 MX, GeForce3, GeForce4 MX, or GeForce4 Titanium graphics card; or with an ATI Radeon 7500, 9000 Pro, or 9700 Pro graphics card</li><li>—PowerBook G4 with a DVI port and an Apple DVI to ADC Adapter</li></ul></li><li>■ A second Apple display can be used with a Power Mac G4 via the DVI port on the NVIDIA GeForce4 MX, GeForce4 Titanium, ATI Radeon 7500, Radeon 9000 Pro, or Radeon 9700 Pro graphics card and the Apple DVI to ADC Adapter.</li></ul>
Technical Specifications

Screen size (diagonal viewable image size)

- Apple Studio Display: 17 inches
- Apple Cinema Display: 20 inches
- Apple Cinema HD Display: 23 inches

Screen type

- Thin film transistor (TFT) active-matrix liquid crystal display

Optimum resolutions

- Apple Studio Display: 1280 by 1024 pixels
- Apple Cinema Display: 1680 by 1050 pixels
- Apple Cinema HD Display: 1920 by 1200 pixels

Display colors (maximum)

- 16.7 million

Viewing angle (typical)

- 170° horizontal; 170° vertical

Brightness (typical)

- Apple Studio Display: 200 cd/m<sup>2</sup>
- Apple Cinema Display: 230 cd/m<sup>2</sup>
- Apple Cinema HD Display: 200 cd/m<sup>2</sup>

Contrast ratio (typical)

- 350:1

Pixel pitch

- Apple Studio Display: 0.264 mm
- Apple Cinema Display: 0.258 mm
- Apple Cinema HD Display: 0.258 mm

Screen treatment

- Antiglare hardcoat

User controls (hardware and software)

- System power on, sleep, wake
- Brightness
- Monitor tilt

Connectors and cables

- Apple Display Connector carries digital video, USB, and power
- Two-port, self-powered USB hub

Electrical requirements

- Input voltage: 24.5V to 28V DC carries digital video, USB, and power
- Maximum power when operating: 40W (Apple Studio Display); 60W (Apple Cinema Display); 70W (Apple Cinema HD Display)
- Energy saver mode: 3W or less

Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –40° to 116° F (–40° to 47° C)
- Operating humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet

Agency approvals

- FCC Part 15 Class B
- EN55022 Class B
- EN55024
- VCCI Class B
- AS/NZS 3548 Class B
- CNS 13438 Class B
- ICES-003 Class B
- ISO 13406
- MPR II
- IEC 60950
- UL 60950
- CSA 60950
- EN60950
- ENERGY STAR
- TCO 95

Size and weight

17-inch Apple Studio Display

- Height: 17.3 inches (43.9 cm)
- Width: 17.6 inches (44.7 cm)
- Depth: 6.9 inches (17.6 cm) minimum; 9.8 inches (24.9 cm) maximum
- Weight: 14.6 pounds (6.6 kg)

20-inch Apple Cinema Display

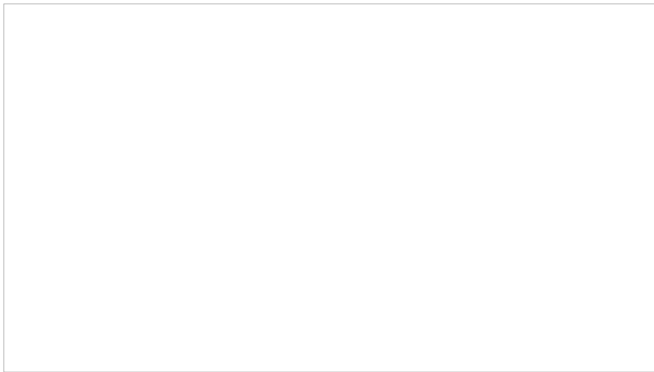
- Height: 17.3 inches (43.9 cm)
- Width: 21.34 inches (54.2 cm)
- Depth: 6.93 inches (17.6 cm) minimum; 10.43 inches (26.5 cm) maximum
- Weight: 18.9 pounds (8.6 kg)

23-inch Apple Cinema HD Display

- Height: 19.2 inches (48.8 cm)
- Width: 24.2 inches (61.4 cm)
- Depth: 7.3 inches (18.7 cm) minimum; 11.1 inches (28.0 cm) maximum
- Weight: 25.3 pounds (11.5 kg)



# iPhone Xs Max - Technical Specifications



## Finish

- Gold
- Space Gray
- Silver

## Capacity<sup>1</sup>

- 64GB
- 256GB
- 512GB

## Size and Weight<sup>2</sup>

- Width: 3.05 inches (77.4 mm)
- Height: 6.20 inches (157.5 mm)
- Depth: 0.30 inch (7.7 mm)
- Weight: 7.34 ounces (208 grams)

## Display

- Super Retina HD display
- 6.5-inch (diagonal) all-screen OLED Multi-Touch display
- HDR display
- 2688-by-1242-pixel resolution at 458 ppi
- 1,000,000:1 contrast ratio (typical)
- True Tone display
- Wide color display (P3)
- 3D Touch
- 625 cd/m<sup>2</sup> max brightness (typical)
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously

*The iPhone Xs Max display has rounded corners that follow a beautiful curved design, and these corners are within a standard rectangle. When measured as a standard rectangular shape, the screen is 6.46 inches diagonally (actual viewable area is less).*

## Splash, Water, and Dust Resistant<sup>3</sup>

- Rated IP68 (maximum depth of 2 meters up to 30 minutes) under IEC standard 60529

## Chip

- A12 Bionic chip
- Next-generation Neural Engine

## Camera

- Dual 12MP wide-angle and telephoto cameras
- Wide-angle: *f*/1.8 aperture

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- Telephoto:  $f/2.4$  aperture
- 2x optical zoom; digital zoom up to 10x
- Portrait mode with advanced bokeh and Depth Control
- Portrait Lighting with five effects (Natural, Studio, Contour, Stage, Stage Mono)
- Dual optical image stabilization
- Six-element lens
- Quad-LED True Tone flash with Slow Sync
- Panorama (up to 63MP)
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels
- Tap to focus with Focus Pixels
- Smart HDR for photos
- Wide color capture for photos and Live Photos
- Local tone mapping
- Advanced red-eye correction
- Exposure control
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging
- Image formats captured: HEIF and JPEG

## Video Recording

- 4K video recording at 24 fps, 30 fps, or 60 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Extended dynamic range for video up to 30 fps
- Optical image stabilization for video
- 2x optical zoom; digital zoom up to 6x
- Quad-LED True Tone flash
- Slo-mo video support for 1080p at 120 fps or 240 fps
- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Take 8MP still photos while recording 4K video
- Playback zoom
- Video geotagging
- Video formats recorded: HEVC and H.264
- Stereo recording

## TrueDepth Camera

- 7MP camera
- $f/2.2$  aperture
- Portrait mode with advanced bokeh and Depth Control
- Portrait Lighting with five effects (Natural, Studio, Contour, Stage, Stage Mono)
- Animoji and Memoji
- 1080p HD video recording at 30 fps or 60 fps
- Smart HDR for photos
- Extended dynamic range for video at 30 fps
- Cinematic video stabilization (1080p and 720p)
- Wide color capture for photos and Live Photos
- Retina Flash
- Backside illumination sensor
- Auto image stabilization
- Burst mode
- Exposure control
- Timer mode

## Face ID

- Enabled by TrueDepth camera for facial recognition

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## Apple Pay

- Pay with your iPhone using Face ID in stores, within apps, and on the web
- Send and receive money in Messages
- Complete purchases made with Apple Pay on your Mac

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1920\***  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 29, 30, 32, 66, 71)  
TD-LTE (Bands 34, 38, 39, 40, 41, 46)  
CDMA EV-DO Rev. A (800, 1900 MHz)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **Model A1921\***  
FDD-LTE (Bands 1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 29, 30, 32, 66, 71)  
TD-LTE (Bands 34, 38, 39, 40, 41, 46)  
CDMA EV-DO Rev. A (800, 1900 MHz)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **All models**  
Gigabit-class LTE with 4x4 MIMO and LAA<sup>4</sup>  
802.11ac Wi-Fi with 2x2 MIMO  
Bluetooth 5.0 wireless technology  
NFC with reader mode

## Location

- Assisted GPS, GLONASS, Galileo, and QZSS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>5</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>5</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>4</sup>
- Wi-Fi calling<sup>4</sup>

## Audio Playback

- Audio formats supported: AAC-LC, HE-AAC, HE-AAC v2, Protected AAC, MP3, Linear PCM, Apple Lossless, FLAC, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), and Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+)
- Wider stereo playback
- User-configurable maximum volume limit

## Video Playback

- Video formats supported: HEVC, H.264, MPEG-4 Part 2, and Motion JPEG
- High Dynamic Range with Dolby Vision and HDR10 content
- AirPlay Mirroring, photos, and video out to Apple TV (2nd generation or later)<sup>6</sup>
- Video mirroring and video out support: Up to 1080p through Lightning Digital AV Adapter and Lightning to VGA Adapter (adapters sold separately)<sup>6</sup>

## Siri<sup>7</sup>

- Use your voice to send messages, set reminders, and more

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- Get intelligent suggestions on your Lock screen and in Messages, Mail, QuickType, and more
- Activate hands-free with only your voice using “Hey Siri”
- Use your voice to run shortcuts from your favorite apps

[Learn more about Siri](#)

## External Buttons and Connectors

- Volume up/down
- Ring/Silent
- Side button
- Built-in stereo speaker
- Lightning connector
- Built-in microphone

## Power and Battery<sup>8</sup>

- Lasts up to 1.5 hours longer than iPhone X
- Talk time (wireless): Up to 25 hours
- Internet use: Up to 13 hours
- Video playback (wireless): Up to 15 hours
- Audio playback (wireless): Up to 65 hours
- Fast-charge capable: Up to 50% charge 30 minutes<sup>9</sup>
- Built-in rechargeable lithium-ion battery
- Wireless charging (works with Qi chargers<sup>10</sup>)
- Charging via USB to computer system or power adapter

## Sensors

- Face ID
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

## Operating System

### iOS 12

iOS is the world’s most personal and secure mobile operating system, packed with powerful features that help you get the most out of every day.

[See what’s new in iOS 12](#)

## Accessibility

Accessibility features help people with disabilities get the most out of their new iPhone Xs. With built-in support for vision, hearing, physical and motor skills, and learning and literacy, you can fully enjoy the world’s most personal device. [Learn more](#)

Features include:

- VoiceOver
- Zoom
- Magnifier
- RTT and TTY support
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health

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- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps
- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- News
- Contacts
- Books
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Find My iPhone
- Find My Friends
- Settings
- Files
- Measure

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.*

- iMovie
- Pages
- Keynote
- Numbers
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips
- Shortcuts

## Headphones

- EarPods with Lightning Connector

## SIM Card

- Dual SIM (nano-SIM and eSIM)<sup>11</sup>
- iPhone Xs and iPhone Xs Max are not compatible with existing micro-SIM cards.

## Rating for Hearing Aids

- M3, T4

## Mail Attachment Support

- **Viewable document types**

.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics; .usdz (USDZ Universal)

## System Requirements

- Apple ID (required for some features)
- Internet access<sup>12</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X 10.11.6 or later
  - PC: Windows 7 or later
  - iTunes 12.8 or later on Mac and iTunes 12.9 or later on PC (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

- **Language support**

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **QuickType keyboard support**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

- **QuickType keyboard support with predictive input**

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

- **Siri languages**

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

- **Dictation languages**

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

- **Definition dictionary support**

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

- **Thesaurus**

English (UK, U.S.)

- **Bilingual dictionary support with English**

Arabic, Chinese (Simplified, Traditional), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish

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- **Spell check**

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPhone with iOS 12
- EarPods with Lightning Connector
- Lightning to USB Cable
- USB Power Adapter
- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPhone Xs and iPhone Xs Max embody Apple's continuing environmental progress. They are designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- Mercury-free display
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Recyclable stainless steel

## Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

## Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet. [See how it works](#)

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\* To identify your iPhone model number, see <https://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

1. Available space is less and varies due to many factors. A standard configuration uses approximately 10GB to 12GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
2. Size and weight vary by configuration and manufacturing process.
3. iPhone Xs and iPhone Xs Max are splash, water, and dust resistant and were tested under controlled laboratory conditions with a rating of IP68 under IEC standard 60529 (maximum depth of 2 meters up to 30 minutes). Splash, water, and dust resistance are not permanent conditions and resistance might decrease as a result of normal wear. Do not attempt to charge a wet iPhone; refer to the user guide for cleaning and drying instructions. Liquid damage not covered under warranty.
4. Data plan required. Gigabit-class LTE, LTE Advanced, LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
5. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
6. Standard Dynamic Range video content only.
7. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
8. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
9. Testing conducted by Apple in August 2018 using preproduction iPhone Xs and iPhone Xs Max units and software and accessory Apple USB-C Power Adapters (30W Model A1882 and 87W Model A1719). Fast-charge testing conducted with drained iPhone units. Charge time varies with environmental factors; actual results will vary.
10. Qi wireless chargers sold separately.
11. eSIM will be available later this year through a software update. Use of eSIM requires a wireless service plan (which may include restrictions on switching service providers and roaming, even after contract expiration). Not all carriers support eSIM. Use of eSIM in iPhone may be disabled when purchased from some carriers. See your carrier for details. To learn more, visit <https://support.apple.com/kb/HT209044>.
12. Wireless broadband recommended; fees may apply.

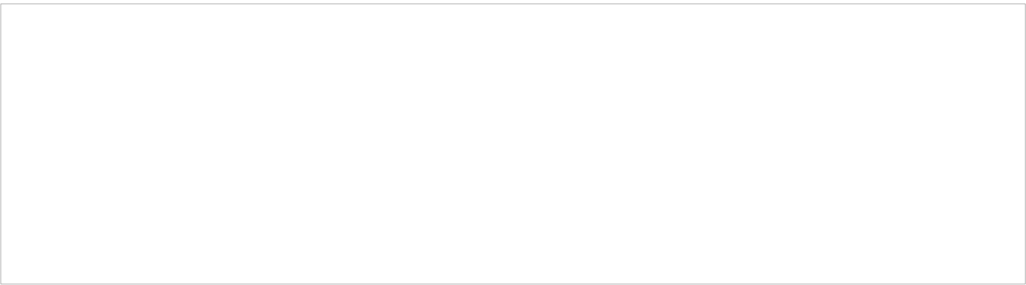
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Some features may not be available for all countries or all areas. [Click here to see complete list.](#)

Published Date: Sep 14, 2018



# iPhone XR - Technical Specifications



## Finish

- (PRODUCT)RED™
- Yellow
- White
- Coral
- Black
- Blue

## Capacity<sup>1</sup>

- 64GB
- 128GB
- 256GB

## Size and Weight<sup>2</sup>

- Width: 2.98 inches (75.7 mm)
- Height: 5.94 inches (150.9 mm)
- Depth: 0.33 inch (8.3 mm)
- Weight: 6.84 ounces (194 grams)

## Display

- Liquid Retina HD display
- 6.1-inch (diagonal) all-screen LCD Multi-Touch display with IPS technology
- 1792-by-828-pixel resolution at 326 ppi
- 1400:1 contrast ratio (typical)
- True Tone display
- Wide color display (P3)
- 625 cd/m2 max brightness (typical)
- Fingerprint-resistant oleophobic coating
- Support for display of multiple languages and characters simultaneously

*The iPhone XR display has rounded corners that follow a beautiful curved design, and these corners are within a standard rectangle. When measured as a standard rectangular shape, the screen is 6.06 inches diagonally (actual viewable area is less).*

## Splash, Water, and Dust Resistant<sup>3</sup>

- Rated IP67 (maximum depth of 1 meter up to 30 minutes) under IEC standard 60529

## Chip

- A12 Bionic chip
- Next-generation Neural Engine

## Camera

- 12MP wide-angle camera
- f/1.8 aperture
- Digital zoom up to 5x
- Portrait mode with advanced bokeh and Depth Control

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- Portrait Lighting with three effects (Natural, Studio, Contour)
- Optical image stabilization
- Six-element lens
- Quad-LED True Tone flash with Slow Sync
- Panorama (up to 63MP)
- Sapphire crystal lens cover
- Backside illumination sensor
- Hybrid IR filter
- Autofocus with Focus Pixels
- Tap to focus with Focus Pixels
- Smart HDR for photos
- Wide color capture for photos and Live Photos
- Local tone mapping
- Advanced red-eye correction
- Exposure control
- Auto image stabilization
- Burst mode
- Timer mode
- Photo geotagging
- Image formats captured: HEIF and JPEG

## Video Recording

- 4K video recording at 24 fps, 30 fps, or 60 fps
- 1080p HD video recording at 30 fps or 60 fps
- 720p HD video recording at 30 fps
- Extended dynamic range for video up to 30 fps
- Optical image stabilization for video
- Digital zoom up to 3x
- Quad-LED True Tone flash
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- Time-lapse video with stabilization
- Cinematic video stabilization (1080p and 720p)
- Continuous autofocus video
- Take 8MP still photos while recording 4K video
- Playback zoom
- Video geotagging
- Video formats recorded: HEVC and H.264
- Stereo recording

## TrueDepth Camera

- 7MP camera
- *f*/2.2 aperture
- Portrait mode with advanced bokeh and Depth Control
- Portrait Lighting with five effects (Natural, Studio, Contour, Stage, Stage Mono)
- Animoji and Memoji
- 1080p HD video recording at 30 fps or 60 fps
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- Enabled by TrueDepth camera for facial recognition

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- Pay with your iPhone using Face ID in stores, within apps, and on the web
- Send and receive money in Messages
- Complete purchases made with Apple Pay on your Mac

[Learn more about Apple Pay](#)

## Cellular and Wireless

- **Model A1984\***  
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TD-LTE (Bands 34, 38, 39, 40, 41)  
CDMA EV-DO Rev. A (800, 1900 MHz)  
UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz)  
GSM/EDGE (850, 900, 1800, 1900 MHz)
- **All models**  
LTE Advanced<sup>4</sup>  
802.11ac Wi-Fi with 2x2 MIMO  
Bluetooth 5.0 wireless technology  
NFC with reader mode

## Location

- Assisted GPS, GLONASS, Galileo, and QZSS
- Digital compass
- Wi-Fi
- Cellular
- iBeacon microlocation

## Video Calling<sup>5</sup>

- FaceTime video calling over Wi-Fi or cellular

## Audio Calling<sup>5</sup>

- FaceTime audio
- Voice over LTE (VoLTE)<sup>4</sup>
- Wi-Fi calling<sup>4</sup>

## Audio Playback

- Audio formats supported: AAC-LC, HE-AAC, HE-AAC v2, Protected AAC, MP3, Linear PCM, Apple Lossless, FLAC, Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), and Audible (formats 2, 3, 4, Audible Enhanced Audio, AAX, and AAX+)
- Wider stereo playback
- User-configurable maximum volume limit

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- Video formats supported: HEVC, H.264, MPEG-4 Part 2, and Motion JPEG
- Supports Dolby Vision and HDR10 content
- AirPlay Mirroring, photos, and video out to Apple TV (2nd generation or later)<sup>6</sup>
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- Use your voice to send messages, set reminders, and more
- Get intelligent suggestions on your Lock screen and in Messages, Mail, QuickType, and more
- Activate with only your voice using “Hey Siri”
- Use your voice to run shortcuts from your favorite apps

[Learn more about Siri](#)

## External Buttons and Connectors

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- Volume up/down
- Ring/Silent
- Side button
- Built-in stereo speaker
- Lightning connector
- Built-in microphone

## Power and Battery<sup>8</sup>

- Lasts up to 1.5 hours longer than iPhone 8 Plus
- Talk time (wireless): Up to 25 hours
- Internet use: Up to 15 hours
- Video playback (wireless): Up to 16 hours
- Audio playback (wireless): Up to 65 hours
- Fast-charge capable: Up to 50% charge 30 minutes<sup>9</sup>
- Built-in rechargeable lithium-ion battery
- Wireless charging (works with Qi chargers<sup>10</sup>)
- Charging via USB to computer system or power adapter

## Sensors

- Face ID
- Barometer
- Three-axis gyro
- Accelerometer
- Proximity sensor
- Ambient light sensor

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[See what's new in iOS 12](#)

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Features include:

- VoiceOver
- Zoom
- Magnifier
- RTT and TTY support
- Siri and Dictation
- Type to Siri
- Switch Control
- Closed Captions
- AssistiveTouch
- Speak Screen

## Built-in Apps

- Camera
- Photos
- Health
- Messages
- Phone
- FaceTime
- Mail
- Music
- Wallet
- Safari
- Maps

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- Siri
- Calendar
- iTunes Store
- App Store
- Notes
- News
- Contacts
- Books
- Home
- Weather
- Reminders
- Clock
- TV
- Stocks
- Calculator
- Voice Memos
- Compass
- Podcasts
- Watch
- Tips
- Find My iPhone
- Find My Friends
- Settings
- Files
- Measure

## Free Apps from Apple

*Pages, Numbers, Keynote, iMovie, GarageBand, iTunes U, Clips, and Apple Store app are preinstalled.*

- iMovie
- Pages
- Numbers
- Keynote
- iTunes U
- GarageBand
- Apple Store
- Trailers
- Apple TV Remote
- iTunes Remote
- Music Memos
- Clips
- Shortcuts

## Headphones

- EarPods with Lightning Connector

## SIM Card

- Dual SIM (nano-SIM and eSIM)<sup>11</sup>
- iPhone XR is not compatible with existing micro-SIM cards.

## Rating for Hearing Aids

- M3, T4

## Mail Attachment Support

- **Viewable document types**  
.jpg, .tiff, .gif (images); .doc and .docx (Microsoft Word); .htm and .html (web pages); .key (Keynote); .numbers (Numbers); .pages (Pages); .pdf (Preview and Adobe Acrobat); .ppt and .pptx (Microsoft PowerPoint); .txt (text); .rtf (rich text format); .vcf (contact information); .xls and .xlsx (Microsoft Excel); .zip; .ics; .usdz (USDZ Universal)

## System Requirements

# 781\_iPhone XR - Technical Specifications.pdf

- Apple ID (required for some features)
- Internet access<sup>12</sup>
- Syncing with iTunes on a Mac or PC requires:
  - Mac: OS X 10.11.6 or later
  - PC: Windows 7 or later
  - iTunes 12.8 or later on Mac and iTunes 12.9 or later on PC (free download from [www.itunes.com/download](http://www.itunes.com/download))

## Environmental Requirements

- Operating ambient temperature: 32° to 95° F (0° to 35° C)
- Nonoperating temperature: -4° to 113° F (-20° to 45° C)
- Relative humidity: 5% to 95% noncondensing
- Operating altitude: tested up to 10,000 feet (3000 m)

## Languages

### • Language support

English (Australia, UK, U.S.), Chinese (Simplified, Traditional, Traditional Hong Kong), French (Canada, France), German, Italian, Japanese, Korean, Spanish (Latin America, Mexico, Spain), Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, Greek, Hebrew, Hindi, Hungarian, Indonesian, Malay, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Slovak, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • QuickType keyboard support

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese - Simplified (Handwriting, Pinyin, Stroke), Chinese - Traditional (Cangjie, Handwriting, Pinyin, Stroke, Sucheng, Zhuyin), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese (Kana, Romaji), Korean, Spanish (Latin America, Mexico, Spain), Arabic (Modern Standard, Najdi), Armenian, Azerbaijani, Belarusian, Bengali, Bulgarian, Catalan, Cherokee, Croatian, Czech, Danish, Dutch, Emoji, Estonian, Filipino, Finnish, Flemish, Georgian, Greek, Gujarati, Hawaiian, Hebrew, Hindi (Devanagari, Transliteration), Hinglish, Hungarian, Icelandic, Indonesian, Irish, Kannada, Latvian, Lithuanian, Macedonian, Malay, Malayalam, Maori, Marathi, Norwegian, Odia, Persian, Polish, Portuguese (Brazil, Portugal), Punjabi, Romanian, Russian, Serbian (Cyrillic, Latin), Slovak, Slovenian, Swahili, Swedish, Tamil (Script, Transliteration), Telugu, Thai, Tibetan, Turkish, Ukrainian, Urdu, Vietnamese, Welsh

### • QuickType keyboard support with predictive input

English (Australia, Canada, India, Singapore, UK, U.S.), Chinese (Simplified, Traditional), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian, Japanese, Korean, Russian, Spanish (Latin America, Mexico, Spain), Portuguese (Brazil, Portugal), Thai, Turkish

### • Siri languages

English (Australia, Canada, India, Ireland, New Zealand, Singapore, South Africa, UK, U.S.), Spanish (Chile, Mexico, Spain, U.S.), French (Belgium, Canada, France, Switzerland), German (Austria, Germany, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong), Arabic (Saudi Arabia, United Arab Emirates), Danish (Denmark), Dutch (Belgium, Netherlands), Finnish (Finland), Hebrew (Israel), Malay (Malaysia), Norwegian (Norway), Portuguese (Brazil), Russian (Russia), Swedish (Sweden), Thai (Thailand), Turkish (Turkey)

### • Dictation languages

English (Australia, Canada, India, Indonesia, Ireland, Malaysia, New Zealand, Philippines, Saudi Arabia, Singapore, South Africa, United Arab Emirates, UK, U.S.), Spanish (Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Spain, Uruguay, U.S.), French (Belgium, Canada, France, Luxembourg, Switzerland), German (Austria, Germany, Luxembourg, Switzerland), Italian (Italy, Switzerland), Japanese, Korean, Mandarin (Mainland China, Taiwan), Cantonese (Mainland China, Hong Kong, Macao), Arabic (Kuwait, Qatar, Saudi Arabia, United Arab Emirates), Catalan, Croatian, Czech, Danish, Dutch (Belgium, Netherlands), Finnish, Greek, Hebrew, Hindi (India), Hungarian, Indonesian, Malaysian, Norwegian, Polish, Portuguese (Brazil, Portugal), Romanian, Russian, Shanghaiese (Mainland China), Slovakian, Swedish, Thai, Turkish, Ukrainian, Vietnamese

### • Definition dictionary support

English, Chinese (Simplified, Traditional), Danish, Dutch, French, German, Hebrew, Hindi, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, Turkish

### • Thesaurus

English (UK, U.S.)

### • Bilingual dictionary support with English

Arabic, Chinese (Simplified, Traditional), Dutch, French, German, Hindi, Italian, Japanese, Korean, Portuguese, Russian, Spanish

### • Spell check

English, French, German, Italian, Spanish, Danish, Dutch, Finnish, Korean, Norwegian, Polish, Portuguese, Russian, Swedish, Turkish

## In the Box

- iPhone with iOS 12
- EarPods with Lightning Connector
- Lightning to USB Cable
- USB Power Adapter

- Documentation

## iPhone and the Environment

Apple takes a complete product life cycle approach to determining our environmental impact. [Learn more](#)

iPhone XR embodies Apple's continuing environmental progress. It is designed with the following features to reduce environmental impact:

- Arsenic-free display glass
- Mercury-free display
- Brominated flame retardant-free
- PVC-free
- Beryllium-free
- Recyclable low-carbon aluminum

### Apple and the Environment

[Learn more](#) about Apple's dedication to reducing the environmental impact of our products and process. Or read our [Product Environmental Reports](#) for detailed information on the environmental performance of every Apple product.

### Apple GiveBack

If you're ready for your next iPhone, Apple GiveBack is a great way to let go of your old one. If it's in good shape, you can trade it in for Apple Store credit. If it's not eligible for credit, we'll recycle it responsibly at no cost to you. Good for you. Good for the planet.

[See how it works](#)

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\* To identify your iPhone model number, see <https://support.apple.com/kb/HT3939>. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE). Cellular technology support is based on iPhone model number and configuration for either CDMA or GSM networks.

1. Available space is less and varies due to many factors. A standard configuration uses approximately 10GB to 12GB of space (including iOS and preinstalled apps) depending on the model and settings. Preinstalled apps use about 4GB, and you can delete these apps and restore them.
2. Size and weight vary by configuration and manufacturing process.
3. iPhone XR is splash, water, and dust resistant and was tested under controlled laboratory conditions with a rating of IP67 under IEC standard 60529 (maximum depth of 1 meter up to 30 minutes). Splash, water, and dust resistance are not permanent conditions and resistance might decrease as a result of normal wear. Do not attempt to charge a wet iPhone; refer to the user guide for cleaning and drying instructions. Liquid damage not covered under warranty.
4. Data plan required. LTE Advanced, LTE, VoLTE, and Wi-Fi calling are available in select markets and through select carriers. Speeds are based on theoretical throughput and vary based on site conditions and carrier. For details on LTE support, contact your carrier and see [www.apple.com/iphone/LTE](http://www.apple.com/iphone/LTE).
5. FaceTime calling requires a FaceTime-enabled device for the caller and recipient and a Wi-Fi connection. Availability over a cellular network depends on carrier policies; data charges may apply.
6. Standard Dynamic Range video content only.
7. Siri may not be available in all languages or in all areas, and features may vary by area. Internet access required. Cellular data charges may apply.
8. All battery claims depend on network configuration and many other factors; actual results will vary. Battery has limited recharge cycles and may eventually need to be replaced by Apple service provider. Battery life and charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) and [www.apple.com/iphone/battery.html](http://www.apple.com/iphone/battery.html) for more information.
9. Testing conducted by Apple in August 2018 using preproduction iPhone XR units and software and accessory Apple USB-C Power Adapters (30W Model A1882 and 87W Model A1719). Fast-charge testing conducted with drained iPhone units. Charge time varies with environmental factors; actual results will vary.
10. Qi wireless chargers sold separately.
11. eSIM will be available later this year through a software update. Use of eSIM requires a wireless service plan (which may include restrictions on switching service providers and roaming, even after contract expiration). Not all carriers support eSIM. Use of eSIM in iPhone may be disabled when purchased from some carriers. See your carrier for details. To learn more, visit <https://support.apple.com/kb/HT209044>.
12. Wireless broadband recommended; fees may apply.

Some features may not be available for all countries or all areas. [Click here to see complete list](#).

iPhone XR has not been authorized as required by the rules of the Federal Communications Commission. iPhone XR is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.

Published Date: Sep 12, 2018

# Power Mac G4 (Quicksilver 2002) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Power Mac G4 (Quicksilver 2002) - Technical Specifications

Configurations			
Order no.	M8705LL/A	M8666LL/A	M8667LL/A
Processor	800-MHz PowerPC G4	933-MHz PowerPC G4	Dual 1-GHz PowerPC G4
On-chip cache	256K L2 at 800 MHz	256K L2 at 933 MHz	256K L2 at 1 GHz per processor
L3 cache (DDR SDRAM)	—	2MB with 3.7-GBps throughput	2MB per processor with 4-GBps throughput
Main memory (PC133 SDRAM)	256MB	256MB	512MB
Hard disk drive <sup>5</sup>	40GB (7200 rpm)	60GB (7200 rpm)	80GB (7200 rpm)
Graphics support	ATI Radeon 7500 with 32MB of DDR SDRAM	NVIDIA GeForce4 MX with 64MB of DDR SDRAM	NVIDIA GeForce4 MX with 64MB of DDR SDRAM
Optical drive	CD-RW	SuperDrive (DVD-R/CD-RW)	SuperDrive (DVD-R/CD-RW)
FireWire	Two ports	Two ports	Two ports
USB	Four ports	Four ports	Four ports
PCI	Four slots	Four slots	Four slots
Ethernet	10/100/1000BASE-T	10/100/1000BASE-T	10/100/1000BASE-T
Wireless networking <sup>8</sup>	AirPort ready	AirPort ready	AirPort ready
Modem <sup>7</sup>	56K	56K	56K
All models include Apple Pro Keyboard, Apple Pro Mouse, and modem cable; Mac OS X v10.1 and Mac OS 9.2; QuickTime, iMovie 2, iDVD 2 (requires SuperDrive), iPhoto, iTunes 2, DVD Player, Mac OS X Mail, Microsoft Internet Explorer, EarthLink, Acrobat Reader 5.0, Art Director's Toolkit, FAXstf 10.0 Preview, FileMaker Pro 5.5 Trial, Graphic Converter, OmniGraffle, OmniOutliner, PCalc, PixelNhançe, and Snapz Pro X; Apple Hardware Test CD; complete setup, learning, and reference documentation; limited warranty; and 30 days of free Internet service through EarthLink.			
Internet access requires an Internet service account; fees may apply. Product contains electronic documentation. Backup copy of software is provided on CD-ROM.			
Options			
Processor	800-MHz, 933-MHz, dual 1-GHz PowerPC G4		
Memory	256MB, 512MB, 1GB, 1.5GB <sup>2</sup>		
Hard disk drives	40GB Ultra ATA (7200 rpm), 60GB Ultra ATA (7200 rpm), 80GB Ultra ATA (7200 rpm), 36GB Ultra160 SCSI (10,000 rpm), 72GB Ultra160 SCSI (10,000 rpm) <sup>5</sup>		
Optical drives	SuperDrive (DVD-R/CD-RW), DVD-ROM/CD-RW Combo, CD-RW		
Graphics	ATI Radeon 7500 with 32MB of DDR SDRAM, NVIDIA GeForce4 MX with 64MB of DDR SDRAM, NVIDIA GeForce4 Ti with 128MB of DDR SDRAM		
Audio	Apple Pro Speakers, Apple iPod, Harman Kardon iSub, Harman Kardon SoundSticks		
Other	AirPort Card, AirPort Base Station, DVI-to-ADC adapter, Zip 250 drive, Ultra SCSI PCI card, Ultra160 SCSI PCI card		
Technical Specifications			



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## Processor

- 800- or 933-MHz PowerPC G4 processor or dual 1-GHz PowerPC G4 processors
- Velocity Engine vector processing unit
- Full 128-bit internal memory data paths
- Powerful floating-point unit supporting single-cycle, double-precision calculations
- Data stream prefetching operations supporting four simultaneous 32-bit data streams
- 256K on-chip L2 cache running at processor speed
- 2MB DDR SDRAM L3 cache per processor, with up to 4GB per second throughput (933-MHz and dual 1-GHz systems)
- 133-MHz system bus supporting over 1-GBps data throughput

## Memory

- 256MB or 512MB of PC133 SDRAM
- Three DIMM slots supporting up to 1.5GB of PC133 SDRAM using the following<sup>2</sup>:
  - 128MB or 256MB DIMMs (64-bit-wide, 128-Mbit)
  - 512MB DIMMs (64-bit-wide, 256-Mbit)

## Storage

- One of the following hard disk drives<sup>5</sup>:
  - 40GB 7200-rpm Ultra ATA
  - 60GB 7200-rpm Ultra ATA
  - 80GB 7200-rpm Ultra ATA
- One of the following optical drives:
  - CD-RW drive (writes CD-R discs at 24x speed, writes CD-RW discs at 10x speed, reads CDs at 32x speed)
  - SuperDrive (combination DVD-R/CD-RW drive; writes DVD-R discs at 2x speed, reads DVDs at 6x speed, writes CD-R discs at 8x speed, writes CD-RW discs at 4x speed, reads CDs at 24x speed)
  - DVD-ROM/CD-RW Combo drive (build-to-order option; reads DVDs at 8x speed, writes CD-R discs at 12x speed, writes CD-RW discs at 8x speed, reads CDs at 32x speed)
- Three 3.5-inch hard drive expansion bays
  - One ATA drive preinstalled on standard configurations
  - Support for up to two internal ATA drives
  - Support for up to three internal SCSI drives
  - Support for a combination of internal SCSI and ATA drives

## Graphics support

- One of the following graphics cards, installed in a dedicated AGP 4X graphics slot:
  - ATI Radeon 7500 graphics card with 32MB of DDR SDRAM and ADC and VGA connectors; supports digital resolutions up to 1920 by 1200 pixels and analog resolutions up to 2048 by 1536 pixels
  - NVIDIA GeForce4 MX graphics card with 64MB of DDR SDRAM and ADC and VGA connectors; supports digital and analog resolutions up to 1920 by 1200 pixels
  - NVIDIA GeForce4 Ti graphics card with 128MB of DDR SDRAM and ADC and DVI connectors (build-to-order option); supports digital and analog resolutions up to 2048 by 1536 pixels
- Dual display support for extended desktop and video mirroring modes<sup>1</sup>

## Expansion

- Four open full-length 64-bit, 33-MHz PCI slots
- One AGP 4X slot with graphics card installed
- Two 400-Mbps FireWire ports (15W total power)<sup>6</sup>
- Four USB ports (two on system, two on keyboard)

## Communications

- 10/100/1000BASE-T Ethernet connector (RJ-45)
- Built-in 56K V.90 modem<sup>7</sup>
- Ready for wireless networking: Built-in antennas and card slot for optional 11-Mbps AirPort Card; IEEE 802.11b compliant<sup>8</sup>

## Audio

- Built-in speaker
- Apple speaker minijack for connection to Apple Pro Speakers
- Optional Apple Pro Speakers
- Headphone/line out minijack
- Support for external third-party USB digital audio peripherals such as microphones, speakers, and MIDI devices

## Keyboard and mouse

- Apple Pro Keyboard
- Apple Pro Mouse

## Electrical requirements and agency approvals

- Line voltage: 115V AC (90V to 132V AC) or 230V AC (180V to 264V AC)
- Frequency: 47 to 63 Hz, single phase
- Maximum continuous power: 360W
- Meets ENERGY STAR requirements

## Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Size and weight

- Height: 17.0 inches (43.2 cm)
- Width: 8.9 inches (22.6 cm)
- Depth: 18.4 inches (46.7 cm)
- Weight: 30 pounds (13.6 kg)<sup>9</sup>

1. The ATI Radeon 7500 and NVIDIA GeForce4 MX cards support one ADC display and one VGA display simultaneously. The NVIDIA GeForce4 Ti supports one ADC display and one DVI or VGA display simultaneously.

2. 999MB maximum per application in Mac OS 9.

3. iTunes is for legal or rightholder-authorized copying only. Don't steal music.

4. Based on Photoshop, BLAST, and MPEG-2 encoding performance.

5. 1GB = 1 billion bytes; actual formatted capacity less.

6. Actual rates will vary.

7. Actual modem speeds lower; speed depends on connection rate and other factors.

8. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.

9. Weight varies by configuration and manufacturing process.

# Apple Cinema Display (20-, 23-, and 30-inch DVI) - Technical Specifications

This article has been archived and is no longer updated by Apple.

Configurations	20-inch Apple Cinema Display	23-inch Apple Cinema HD Display	30-inch Apple Cinema HD Display
Model	M9177LL/A	M9178LL/A	M9179LL/A
Screen size (diagonal viewable image size)	20 inches (viewable)	23 inches (viewable)	30 inches (29.7 inches viewable)
Screen type	Thin film transistor (TFT) active-matrix liquid crystal display (AMLCD)		
Resolutions	<ul style="list-style-type: none"><li>1680 x 1050 pixels (optimum resolution)</li><li>1280 x 800 pixels</li><li>1024 x 640 pixels</li></ul>	<ul style="list-style-type: none"><li>1920 x 1200 pixels (optimum resolution)</li><li>1280 x 800 pixels</li><li>1024 x 640 pixels</li></ul>	<ul style="list-style-type: none"><li>2560 x 1600 pixels (optimum resolution)</li><li>2048 x 1280</li><li>1920 x 1200</li><li>1280 x 800</li><li>1024 x 640</li></ul>
Display colors (maximum)	16.7 million		
Viewing angle (typical)	170° horizontal; 170° vertical		
Brightness (typical)	250 cd/m2	270 cd/m2	400 cd/m2
Contrast ratio (typical)	400:1		
Response time (typical)	16 ms		
Pixel pitch	0.258 mm		0.250 mm
Screen treatment	Antiglare hardcoat		
User controls (hardware and software)	Display power, system sleep, system wake, brightness and display tilt		
Cables	DVI (Digital Visual Interface), FireWire 400, USB 2.0 and DC power (24.5 V)		
Connectors	Two-port, self-powered USB 2.0 hub, two FireWire 400 ports and Kensington security port		
VESA mount adapter	Compatible with VESA FDMI (MIS-D, 100, C) compliant mounting solutions. (Requires optional Cinema Display VESA Mount Adapter)		
Mac Pro compatibility	All new Mac Pro systems support two Apple Cinema Displays, including dual-link DVI for one 30-inch model. Support for two 30-inch Apple Cinema HD Displays requires two dual-link DVI ports — available in configurations with either the ATI Radeon X1900 XT or the NVIDIA Quadro FX 4500 — or by installing an additional NVIDIA GeForce 7300 GT card. Support for more than two displays requires installation of one or more additional NVIDIA GeForce 7300GT cards.		
Power Mac G5 compatibility	Any new dual- or quad-core Power Mac G5 supports two Apple Cinema Displays, including dual-link DVI for one 30-inch model. Support for two 30-inch Apple Cinema HD Displays requires two dual-link DVI ports, available in configurations with the NVIDIA Quadro FX 4500 or by installing an additional NVIDIA GeForce 6600 card. Support for more than two displays requires installation of one or more additional NVIDIA GeForce 6600 cards.		
MacBook Pro compatibility	All MacBook Pro Models		
MacBook compatibility	Requires Apple Mini-DVI to DVI Adapter		N/A
iMac compatibility	Intel-based iMac models (requires Apple Mini-DVI to DVI Adapter)		N/A
Mac mini compatibility	All Mac mini models		N/A

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<b>PowerBook compatibility</b>	PowerBook G4 with DVI port	PowerBook G4 with dual-link DVI port
<b>Limited warranty and service</b>	Your Apple display comes with 90 days of free telephone support and a one-year limited warranty. To extend your service and support to three full years, you may register one display in the AppleCare Protection Plan when you purchase the display at the same time as a Mac Pro, MacBook Pro, or Mac mini. To cover an individual display or second display, purchase the AppleCare Protection Plan for Apple Display. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-authorized technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	

Build-to-Order Options  
Extras and accessories from the online Apple Store or an authorized Apple reseller.

<b>Connectors</b>	<ul style="list-style-type: none"><li>• Belkin ADC to DVI Connector Cable</li><li>• iSight Accessory Kit</li></ul>
<b>Ergonomics</b>	VESA Mount Adapter
<b>Security</b>	Kensington Slim Kevlar MicroSaver Lock
<b>Graphics cards</b>	<ul style="list-style-type: none"><li>• NVIDIA GeForce 6600</li><li>• Other cards may be installed at the time of system configuration</li></ul>

## Technical Specifications and Approvals

### Electrical requirements

- Input voltage: 100-240 VAC 50-60Hz
- Maximum power when operating: 65W (Apple Cinema Display); 90W (Apple Cinema HD Display); 150W (Apple Cinema HD Display)
- Energy saver mode: 3W or less

### Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Operating humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet

### Size and weight

- 20-inch Apple Cinema Display
  - Height: 16.1 inches (41 cm)
  - Width: 18.5 inches (47.1 cm)
  - Depth: 6.8 inches (17.4 cm)
  - Weight: 14.5 pounds (6.6 kg)
- 23-inch Apple Cinema HD Display
  - Height: 17.7 inches (45 cm)
  - Width: 21.1 inches (53.6 cm)
  - Depth: 7.3 inches (18.7 cm)
  - Weight: 15.5 pounds (7.03 kg)
- 30-inch Apple Cinema HD Display
  - Height: 21.3 inches (54.3 cm)
  - Width: 27.2 inches (68.8 cm)
  - Depth: 8.46 inches (21.5 cm)
  - Weight: 27.5 pounds (12.47 kg)

### Agency approvals

- FCC Part 15 Class B
- EN55022 Class B
- EN55024
- VCCI Class B
- AS/NZS 3548 Class B
- CNS 13438 Class B
- ICES-003 Class B
- MPR II

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- IEC 60950
- UL 60950
- CSA 60950
- EN60950
- ENERGY STAR
- TCO 03

Published Date: Apr 6, 2016

# Mac mini (Mid 2007) - Technical Specifications

This article has been archived and is no longer updated by Apple.

	1.83GHz Mac mini (MB138LL/A)	2.0GHz Mac mini (MB139LL/A)
<b>Processor</b>	1.83GHz Intel Core 2 Duo	2.0GHz Intel Core 2 Duo
<b>L2 cache</b>	2MB shared	4MB shared
<b>System bus</b>	667MHz	
<b>Memory</b>	1GB of 667MHz DDR2 SDRAM (PC2-5300), supports up to 2GB	
<b>Hard drive<sup>2</sup></b>	80GB 5400-rpm Serial ATA	120GB 5400-rpm Serial ATA
<b>Optical drive</b>	Slot-loading Combo drive (DVD-ROM/CD-RW)	Slot-loading SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW)
<b>Graphics</b>	Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory <sup>1</sup>	
<b>Ports</b>	One FireWire 400 port (8 watts); four USB 2.0 ports (up to 480 Mbps); DVI output; VGA output (using included adapter); S-video and composite video output <sup>4</sup>	
<b>Audio</b>	Built-in speakers, combined optical digital audio input/audio line in, combined optical digital audio output/headphone out	
<b>Networking</b>	Built-in 10/100/1000BASE-T (Gigabit)	
<b>Wireless</b>	Built-in AirPort Extreme Wi-Fi (802.11g) <sup>3</sup> ; built-in Bluetooth 2.0+EDR (Enhanced Data Rate) module	
<b>Limited warranty and service</b>	Your Mac mini comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.	

## In the box

- Mac mini
- Apple Remote
- Power cord
- Install/restore DVDs
- Printed and electronic documentation

## Processor and memory

- 1.83GHz or 2.0GHz Intel Core 2 Duo processor
- 2MB or 4MB on-chip L2 cache
- 667MHz frontside bus
- 1GB of 667MHz DDR2 SDRAM (PC2-5300) on two SO-DIMMs; supports up to 2GB

## Size and weight

- Height: 2 inches (5.08 cm)
- Width: 6.5 inches (16.51 cm)
- Depth: 6.5 inches (16.51 cm)
- Weight: 2.9 pounds (1.31 kg)

## Peripheral connections

- One FireWire 400 port (8 watts)
- Four USB 2.0 ports (up to 480 Mbps)

## Graphics and video support

- Intel GMA 950 graphics processor with 64MB of DDR2 SDRAM shared with main memory<sup>1</sup>
- DVI video output to support digital resolutions up to 1920 by 1200 pixels; supports 20-inch Apple Cinema Display and 23-inch Apple Cinema HD Display; supports coherent digital displays up to 154MHz; supports noncoherent digital displays up to 135MHz
- VGA video output (using included adapter) to support analog resolutions up to 1920 by 1080 pixels
- S-video and composite video output to connect directly to a TV or projector (using Apple DVI to Video Adapter, sold separately)

## Communications

- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard)<sup>3</sup>
- Built-in Bluetooth 2.0 + Enhanced Data Rate (EDR) up to 3 Mbps

## Audio

- Built-in speaker
- Combined optical digital audio input/audio line in (minijack)
- Combined optical digital audio output/headphone out (minijack)

## Storage

- 80GB or 120GB 5400-rpm Serial ATA hard disk drive; optional 160GB drive<sup>2</sup>
- One of the following optical drives:

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- Slot-loading Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed
- Slot-loading SuperDrive with double-layer support (DVD±R DL/DVD±RW/CD-RW): writes DVD+R DL and DVD-R DL discs at up to 2.4x speed, writes DVD-R and DVD+R discs at up to 8x speed, writes DVD-RW and DVD+RW discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 110W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Software

- Mac OS X v10.4 Tiger (includes Spotlight, Dashboard, Mail, iChat AV, Safari, Address Book, QuickTime, iCal, DVD Player, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand) and Apple Hardware Test
- Front Row

## Options

### Configure to Order

- 120GB hard drive (1.83GHz only)
- 160GB hard drive
- Up to 2GB of 667MHz DDR2 SDRAM
- Apple Wireless Keyboard (MB167LL/A)
- Apple Keyboard (MB110LL/A)
- Apple wireless Mighty Mouse (MB111LL/A)
- Apple Mighty Mouse (MB112LL/A)
- Apple USB Modem (MA034Z/A)

## Accessories

- AirPort Express Base Station (M9470LL/A)
- AirPort Extreme Base Station (MB053LL/A)
- Apple 8x DVD-R Media Kit (M9472G/A)
- Apple DVI to Video Adapter (M9267G/A)
- Apple FireWire Cable (M8706G/A)
- AppleCare Protection Plan (MA514LL/A)
- .Mac Subscription (MA927Z/A)
- iWork '08 (MA790Z/A)

1. Memory available to Mac OS X may vary depending on graphics needs. Minimum graphics memory usage is 80MB, resulting in 944MB of system memory available.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Physical data rate based on IEEE 802.11g specification. Actual data throughput will be lower. Range will vary with site conditions. Assumes AirPort Express or AirPort Extreme network with 802.11g-enabled computer. Speed and range will be less if an 802.11b product joins the network. Accessing the wireless network requires an AirPort- or AirPort Extreme-enabled computer or other Wi-Fi Certified 802.11a/b/g-enabled computer. Wireless Internet access requires AirPort Express or AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort.
4. Requires Apple DVI to Video Adapter, sold separately

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Published Date: Apr 6, 2016

# Power Mac G5 (June 2004) - Technical Specifications

This article has been archived and is no longer updated by Apple.

Configurations			
Order number	Dual 1.8GHz SuperDrive M9454LL/A	Dual 2GHz SuperDrive M9455LL/A	Dual 2.5GHz SuperDrive M9457LL/A
G5 Processor	Dual 1.8GHz PowerPC G5	Dual 2GHz PowerPC G5	Dual 2.5GHz PowerPC G5
L2 Cache	512K per processor		
Frontside bus	900MHz per processor	1GHz per processor	1.25GHz per processor
DDR SDRAM main memory	256MB PC3200 (400MHz) Supports up to 4GB	512MB PC3200 (400MHz) Supports up to 8GB	
8X AGP Pro graphics	NVIDIA GeForce FX 5200 Ultra with 64MB DDR SDRAM	ATI RADEON 9600 XT with 128MB DDR SDRAM	
Hard drive <sup>(1)</sup>	80GB Serial ATA; 7200 rpm	160GB Serial ATA; 7200 rpm	
Optical drive	SuperDrive (DVD-R/CD-RW)		
PCI slots	Three open full-length 33MHz, 64-bit PCI slots	Three open full-length PCI-X slots: one 133MHz, 64-bit slot and two 100MHz, 64-bit slots	
Expansion	One FireWire 800 port, two FireWire 400 ports (one on front); three USB 2.0 ports (one on front), two USB 1.1 ports (on keyboard); AGP 8X Pro slot with graphics card installed, including ADC connector and DVI connector		
Bays	Two internal hard drive bays (1 occupied); one optical drive bay		
Networking	Built-in 10/100/1000BASE-T Ethernet and 56K V.92 modem (5)		
Wireless	AirPort Extreme ready (based on 802.11g specification; IEEE 802.11b Wi-Fi certified) (2); Bluetooth option		
Audio	Optical digital audio input, optical digital audio output, analog audio input, analog audio output, front headphone minijack and speaker		
System software	Mac OS X version 10.3 “Panther”		
Software	iLife (includes iTunes, iPhoto, iMovie, iDVD and GarageBand), Art Directors Toolkit, EarthLink TotalAccess 2004, GraphicConverter, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Zinio Reader, Mail, iChat AV, Safari, Sherlock, Address Book, QuickTime, iSync, iCal, DVD Player, Classic environment, Xcode Developer Tools		
Hardware accessories	Apple Keyboard, Apple Mouse, USB keyboard extension cable, DVI to VGA adapter, modem cable, AirPort antenna		
Limited warranty and service	Your Power Mac G5 comes with 90 days of free telephone support and a one-year limited warranty. Purchase the AppleCare Protection Plan to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit Apple support or call 800-823-2775.		

Build-to-Order Options	
Order a custom-configured computer from the online Apple Store or an authorized Apple reseller.	
Memory	(PC3200 DDR SDRAM; installed in pairs): 256MB, 512MB, 1GB, 2GB, 4GB, 8GB <sup>(1)</sup>
Hard drives <sup>(1)</sup>	80GB Serial ATA 160GB Serial ATA 250GB Serial ATA 2X 250GB Serial ATA
Optical drives	SuperDrive (DVD-R/CD-RW), Combo drive (DVD-ROM/CD-RW)
Graphics	NVIDIA GeForce FX 5200 Ultra with 64MB of DDR SDRAM ATI Radeon 9600 XT with 128MB of DDR SDRAM ATI Radeon 9800 XT with 256MB of DDR SDRAM
Audio	Apple iPod Logitech Z680 5.1 Speakers T7156LL/A Monster 1m Toslink Digital Fiber Optic Cable T7153LL/A Monster 2m Toslink Digital Fiber Optic Cable T7154LL/A
External storage	Xserve RAID with Apple Fibre Channel PCI Card
Wireless	AirPort Extreme Card M8881LL/A AirPort Extreme Base Station M8930LL/A AirPort Express Featuring AirTunes M9470LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A Internal Bluetooth module with antenna

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<b>Displays</b>	Apple Studio Display (17-inch flat panel) M7649ZM/B Apple Cinema Display (20-inch flat panel) M8893ZM/A Apple Cinema HD Display (23-inch flat panel) M8537ZM/A Apple DVI to ADC Display Adapter M8661LL/B Apple DVI to Video Adapter M9267G/A
<b>Services</b>	AppleCare Protection Plan M8850LL/A .Mac Subscription M8778LL/A

## Technical Specifications

### Processing

- Dual 1.8GHz, dual 2GHz or dual 2.5GHz 64-bit PowerPC G5 microprocessors
- PowerPC processor architecture with 64-bit data paths and registers
- Native support for 32-bit application code
- 512K on-chip L2 cache running at processor speed
- Parallel data structure supporting up to 215 simultaneous in-flight instructions
- Simultaneous issue of up to 10 out-of-order operations
- Dual-pipeline Velocity Engine for 128-bit single-instruction, multiple-data (SIMD) processing
- Two independent double-precision floating-point units
- Advanced three-stage branch-prediction logic
- Two 900MHz, 1GHz or 1.25GHz 64-bit DDR frontside busses supporting up to 10GBps data throughput
- Point-to-point system controller

### Memory

- 128-bit data paths for up to 6.4GBps memory throughput
- Dual 1.8GHz systems:
  - 256MB of PC3200 (400MHz) DDR SDRAM
  - Four DIMM slots supporting up to 4GB of main memory
- Dual 2GHz and dual 2.5GHz systems:
  - 512MB of PC3200 (400MHz) DDR SDRAM
  - Eight DIMM slots supporting up to 8GB of main memory
- Support for the following DIMMs (in pairs):
  - 128MB DIMMs (64-bit-wide, 128- or 256-Mbit)
  - 256MB DIMMs (64-bit-wide, 128- or 256-Mbit)
  - 512MB DIMMs (64-bit-wide, 256-Mbit)
  - 1GB DIMMs (64-bit-wide, 256-Mbit)

### Graphics and displays

- AGP 8X Pro graphics slot supporting up to 2GBps data throughput, with one of the following graphics cards installed:
  - NVIDIA GeForce FX 5200 Ultra with 64MB of DDR SDRAM
  - ATI Radeon 9600 XT with 128MB of DDR SDRAM
  - ATI Radeon 9800 XT with 256MB of DDR SDRAM (build-to-order option; occupies AGP slot and adjacent PCI slot)
- Support for digital resolutions up to 1920 by 1200 pixels
- Support for analog resolutions up to 1600 by 1200 pixels
- ADC and DVI connectors; DVI to VGA adapter included
- Dual display support for extended desktop and video mirroring modes
- Support for up to two Apple flat panel displays<sup>(3)</sup>

### Storage

- Two 3.5-inch hard drive bays, each with a 150MBps Serial ATA controller; with the following hard drive options:
  - 1 80GB 7200-rpm Serial ATA; 8MB memory buffer <sup>(1)</sup>
  - 1 160GB 7200-rpm Serial ATA; 8MB memory buffer<sup>(1)</sup>
  - 1 or 2 250GB 7200-rpm Serial ATA; 8MB memory buffer<sup>(1)</sup> (build-to-order option)
- Optical drive bay with SuperDrive (DVD-R/CD-RW) installed; writes DVD-R discs at up to 8x speed, reads DVDs at up to 10x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 32x speed

### PCI expansion

- Dual 1.8GHz systems:
  - Three open full-length 33MHz, 64-bit PCI slots
- Dual 2GHz and dual 2.5GHz systems:
  - One open full-length 133MHz, 64-bit PCI-X slot and two open full-length 100MHz, 64-bit PCI-X slots

### Communications

- 10/100/1000BASE-T Ethernet (RJ-45)
- Built-in 56K V.92 modem (RJ-11) <sup>(5)</sup>
- Expansion slot for optional 54 Mbps AirPort Extreme Card (based on IEEE 802.11g specification; 802.11b Wi-Fi certified) <sup>(2)</sup>
- External AirPort Extreme antenna
- Optional internal Bluetooth 1.1 module and antenna

### Peripherals and audio

- One FireWire 800 port and two FireWire 400 ports (one on front panel, 15W total power)
- Three USB 2.0 ports (one on front panel), two USB 1.1 ports on keyboard
- Front headphone minijack and speaker
- Optical digital audio input and output Toslink connectors
- Stereo audio input and output minijacks

### Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-125V AC or 200-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum current: 6.5A (low-voltage range) or 7.5A (high-voltage range)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

### Size and weight

- Height: 20.1 inches (51.1 cm)
- Width: 8.1 inches (20.6 cm)
- Depth: 18.7 inches (47.5 cm)
- Weight: 44.4 pounds (20.2 kg) <sup>(6)</sup>

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Wireless Internet access requires AirPort Extreme Card, wireless access point, and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not compatible with AirPort and AirPort Extreme. Range may vary with site conditions.
3. Second Apple flat-panel display requires Apple DVI to ADC Adapter, sold separately.
4. Check with manufacturer for compatibility.
5. Actual rates will vary.
6. Weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply.  
Product contains electronic documentation.  
Backup copy of software is included.

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# iBook G4 (Early 2004) - Technical Specifications

## iBook G4 (Early 2004) - Technical Specifications

Configurations	12-inch Combo Drive	14-inch Combo Drive	14-inch Combo Drive
Model	M9426LL/A	M9418LL/A	M9419LL/A
Processor	1GHz PowerPC G4		1.2GHz PowerPC G4
Level 2 Cache	512K at 1GHz		512K at 1.2GHz
System bus	133MHz		
Memory (DDR SDRAM)	256MB PC2100 (266MHz); 1.25GB maximum; 1 available expansion slot		
Hard drive <sup>(3)</sup>	30GB ATA/100 4200 rpm	40GB ATA/100 4200 rpm	60GB ATA/100 4200 rpm
Optical drive	Slot-loading Combo (DVD-ROM/CD-RW); SuperDrive available as a build-to-order option (14-inch models only)		
Display	12.1-inch (diagonal) TFT XGA	14.1-inch (diagonal) TFT XGA	
Graphics support	ATI Mobility Radeon 9200 with 32MB of DDR SDRAM		
FireWire	One FireWire 400 port at up to 400 Mbps		
USB	Two USB 2.0 ports at up to 480 Mbps each		
VGA, S-video and composite video output	Video mirroring supports VGA video out to an external display or projector (requires included Apple VGA Video Adapter) and S-video and composite video out to a TV or VCR (requires optional Apple Video Adapter, sold separately).		
Modem <sup>(4)</sup>	Built-in 56K V.92 modem		
Ethernet	Built-in 10/100BASE-T Ethernet		
Wireless support <sup>(5)</sup>	AirPort Extreme ready; optional internal Bluetooth module available		AirPort Extreme built-in; optional internal Bluetooth module available
System Software	Mac OS X version 10.3 "Panther"		
Software	All models include Mac OS X, Classic environment, Mail, iChat AV, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie, iDVD <sup>(2)</sup> , GarageBand), iSync, iCal, DVD Player, AppleWorks, Mac OS X Chess, Microsoft Internet Explorer, EarthLink (includes 30 days of free dial-up service with activation), Quicken 2004 for Mac, World Book 2004 Edition, Tony Hawk's Pro Skater 4, Deimos Rising, Sound Studio, Zinio Reader, Apple Hardware Test		
Service and Support	90 days of free telephone support and one-year limited warranty. Product contains documentation. Backup copy of software is provided on CD-ROM.		
Internet Access	30 days of free dial-up Internet service with EarthLink (North America only) activation. Internet access requires an Internet service account; fees may apply.		

Build-to-Order Options	Order a custom-configured iBook from the online Apple Store or an authorized Apple reseller.
Wireless	AirPort Extreme Card M8881LL/A AirPort Extreme Base Station M8930LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A D-Link DBT-120 USB Bluetooth Adapter T6295ZM/A
Adapters and cables	Apple Video Adapter M9109G/A Apple VGA Display Adapter M8639G/A Apple FireWire Cable (4-pin to 6-pin, 1.8 meter) M8706G/A
Battery and power	Apple Portable Power Adapter M8943LL/A iBook Rechargeable Battery (12.1-inch iBook with CD-ROM) M9337G/A iBook Rechargeable Battery (14.1-inch iBook) M9338G/A
Accessories	Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269ZM/A Apple Keyboard (White) M9034LL/A Apple Mouse (White) M9035G/A iSight M8817LL/A
Services	AppleCare Protection Plan M8852LL/A .Mac Subscription: Retail Box MA175Z/A or Family Pack MA176Z/A

### Technical Specifications

#### Processor and memory

- 1GHz or 1.2GHz PowerPC G4 processor with Velocity Engine and 512K on-chip level 2 cache running at 1GHz
- 133 MHz system bus
- 256MB of PC2100 (266MHz) DDR SDRAM (256MB built-in and one available SO-DIMM slot) with support for up to 1.25GB

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## Storage

- 30GB, 40GB or 60GB Ultra ATA hard disk drive <sup>(3)</sup>
- One of the following optical drives:
  - Combo drive (DVD-ROM/CD-RW); writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads DVD-ROM discs at up to 8x speed, reads CD-ROM discs at up to 24x speed
  - Slot-loading SuperDrive (DVD-R/CD-RW); writes DVD-R discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 24x speed (available as a build-to-order option for the 14-inch model)
- Support for external FireWire and USB storage devices

## Display

- Choice of built-in 12.1-inch or 14.1-inch (diagonal) TFT XGA active-matrix display
- Support for millions of colors at 1024 x 768 pixel resolution
- Support for resolution scaling to 800 x 600 pixel and 640 x 480 pixel resolution with millions of colors

## Graphics support

- ATI Mobility Radeon 9200 graphics processor with 32MB of dedicated video memory and AGP 4X support

## Communications

- Built-in 56K V.92 modem (RJ-11 connector) <sup>(4)</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and expansion slot for optional 54Mbps AirPort Extreme Card; (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) <sup>(5)</sup>
- Optional Internal Bluetooth module available as a built-to-order option

## Peripheral connections

- Two 480 Mbps USB 2.0 ports
- One FireWire 400 port at up to 400 Mbps <sup>(5)</sup>

## Audio

- 16-bit CD-quality stereo headphone jack
- Built-in stereo speakers
- Built-in microphone
- Support for external USB audio devices such as microphones and speakers

## Video

- VGA video output for video mirroring on an external display or projector (24-bit color) with included Apple VGA Display Adapter.
- S-video and composite video output to TV or projector (requires Apple Video Adapter, sold separately)

## Battery

- iBook G4 with 12.1-inch display: 50-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge <sup>(1)</sup>
- iBook G4 with 14.1-inch display: 61-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge <sup>(1)</sup>
- Integrated charge indicator LEDs on battery

## Keyboard and trackpad

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement) and embedded numeric keypad
- Solid-state trackpad for precise cursor control; supports tap, double-tap and drag capabilities

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60 Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

## Size and weight (12.1-inch model)

- Height: 1.35 inches (3.42 cm)
- Width: 11.2 inches (28.5 cm)
- Depth: 9.06 inches (23.0 cm)
- Weight: 4.9 pounds (2.2 kg) <sup>(7)</sup>

## Size and weight: (14.1-inch model)

- Height: 1.35 inches (3.42 cm)
- Width: 12.7 inches (32.3 cm)
- Depth: 10.2 inches (25.9 cm)

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## ■ **Weight:** 5.9 pounds (2.7 kg) <sup>(7)</sup>

1. Battery life depends on configuration and use.
2. Burning DVDs in iDVD requires an Apple SuperDrive, but iDVD projects can be saved as an archive on iBook G4 models with a Combo Drive and later transferred to a SuperDrive-equipped system and burned to a DVD.
3. 1GB = 1 billion bytes; actual formatted capacity less.
4. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.
5. Wireless Internet access requires AirPort Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.
6. Actual rates will vary.
7. Weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

**Published Date:** Jul 26, 2017

# PowerBook G4 (12-inch 1.33GHz) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (12-inch 1.33GHz) - Technical Specifications

Configurations	12-inch Combo drive	12-inch SuperDrive	15-inch Combo drive	15-inch SuperDrive	17-inch SuperDrive
Model	M9183LL/A	M9184LL/A	M9421LL/A	M9422LL/A	M9462LL/A
Processor	1.33GHz PowerPC G4			1.5GHz PowerPC G4	
Memory	256MB PC2700 (333MHz) DDR SDRAM			512MB PC2700 (333MHz) DDR SDRAM	
Display	12.1-inch (diagonal), 1024 x 768 resolution, TFT		15.2-inch (diagonal), 1280 x 854 resolution, TFT widescreen		17-inch (diagonal), 1440 x 900 resolution, TFT widescreen
Graphics	NVIDIA GeForce FX Go5200 with 64MB of DDR SDRAM		ATI Mobility Radeon 9700 with 64MB of DDR SDRAM (available with 128MB as BTO option on 1.5GHz configurations)		
Hard disk drive <sup>(1)</sup>	60GB Ultra ATA/100			80GB Ultra ATA/100	
Slot-loading optical drive	Combo drive (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)	Combo drive (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)	
Ethernet	Built-in 10/100BASE-T		Built-in 10/100/1000BASE-T (Gigabit)		
Wireless <sup>(2)</sup>	Built-in 54-Mbps AirPort Extreme; built-in Bluetooth				
Modem <sup>(3)</sup>	Built-in 56K V.92 modem				
Keyboard	Full size			Full size, illuminated with ambient light sensor	
System software	Mac OS X v10.3 Panther				
Software	Mail, iChat, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie, Garageband and iDVD <sup>(4)</sup> ), iSync, iCal, DVD Player, Classic environment, Acrobat Reader, Art Directors Toolkit, EarthLink TotalAccess (includes 30 days of free dial-up service with Earthlink activation), FileMaker Pro Trial, GraphicConverter, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Zinio Reader, Developer Tools and Apple Hardware Test				
Video accessories	Mini-DVI to DVI adapter, mini-DVI to VGA adapter		S-video to composite adapter, DVI to VGA adapter		
Hardware accessories	Modem cable, power adapter, AC wall plug, power cord				
Limited warranty and service	Your PowerBook G4 comes with 90 days of telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> and get three years of service and support. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.				
Internet access	All models also include 30 days of free Internet service through EarthLink. Internet access requires a compatible Internet service provider; fees may apply.				
Build-to-Order Options	Order a custom-configured PowerBook G4 from the online <a href="#">Apple Store</a> or an authorized Apple reseller.				
Memory	256MB (12- and 15-inch models only), 512MB, 1GB SO-DIMMs				
Hard drive	80GB 5400-rpm drive (available only from the online Apple Store)				
Wireless	AirPort Extreme Base Station M8930LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A				
Battery and power	Apple Portable Power Adapter M8943LL/A PowerBook G4 12-inch Rechargeable Battery M9572G/A PowerBook G4 15-inch Rechargeable Battery M9325G/A PowerBook G4 17-inch Rechargeable Battery M9326G/A				
Built-in keyboard	Illuminated keyboard with ambient light sensor (1.33GHz 15-inch model only)				
External keyboard and mouse	Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269ZM/A Apple Keyboard (White) M9034LL/A Apple Mouse (White) M9035G/A				
Services	AppleCare Protection Plan M8853LL/A .Mac Subscription M9036Z/A				

### Technical Specifications

#### Processor and Memory

- 12-inch models
  - 1.33GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system

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bus

- 256MB of PC2700 (333MHz) DDR SDRAM; one open SO-DIMM slot; support for up to 1.25GB
- 15-inch models
  - 1.33GHz or 1.5GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus
  - 256MB or 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB
- 17-inch model
  - 1.5GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus
  - 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB

## Storage <sup>(1)</sup>

- 60GB 4200-rpm Ultra ATA/100 hard drive (12-inch models)
- 60GB or 80GB 4200-rpm Ultra ATA/100 hard drive (15-inch models)
- 80GB 4200-rpm Ultra ATA/100 hard drive (17-inch model)
- 80GB 5400-rpm Ultra ATA/100 hard drive available as CTO option on all models (available only from the online Apple Store)
- One of the following slot-loading optical drives
  - Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed (12- and 15-inch models)
  - SuperDrive (DVD-R/CD-RW): writes DVD-R discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 24x speed

## Communications

- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) <sup>(2)</sup>
- Built-in Bluetooth 1.1
- Built-in 10/100BASE-T Ethernet (RJ-45 connector) (12-inch models)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector) (15-inch and 17-inch models)
- Built-in 56K V.92 modem (RJ-11 connector) <sup>(3)</sup>

## Expansion

- One FireWire 400 (IEEE 1394a) port at up to 400 Mbps <sup>(5)</sup>
- One FireWire 800 (IEEE 1394b) port at up to 800 Mbps (15-inch and 17-inch models) <sup>(5)</sup>
- Two USB 2.0 ports at up to 480 Mbps
- One PC Card/CardBus slot supporting one Type I or Type II card (15-inch and 17-inch models)

## Display

- 12.1-inch (diagonal) TFT display (12-inch models)
  - Support for millions of colors at 1024 x 768 pixel resolution
  - Support for resolution scaling to 800 x 600 pixel and 640 x 480 pixel resolution with millions of colors
- 15.2-inch (diagonal) TFT display (15-inch models)
  - Support for millions of colors at 1280 x 854 pixel resolution
  - Support for resolutions of 1280 x 854 (native), 1152 x 768, 896 x 600, 720 x 480, and 640 x 480 pixels at 3:2 aspect ratio; 1024 x 768, 800 x 600 and 640 x 480 pixels at 4:3 aspect ratio
- 17-inch (diagonal) TFT display (17-inch model)
  - Support for millions of colors at 1440 x 900 pixel resolution
  - Supported resolutions: 1440 x 900 (native), 1152 x 720, 1024 x 768, 1024 x 640 and 800 x 600 pixels at 16:10 aspect ratio; 1024 x 768, 800 x 600 and 640 x 480 pixels at 4:3 aspect ratio

## Video and graphics support

- NVIDIA GeForce FX Go5200 graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory (12-inch models)
  - Dual display and video mirroring: Simultaneously supports up to 1024 x 768 pixels on the built-in display and up to 2048 x 1536 pixels on an external display, both at millions of colors <sup>(7)</sup>
- ATI Mobility Radeon 9700 graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory, optional 128MB of video memory on 1.5GHz (15- and 17-inch models)
  - Dual display and video mirroring: Simultaneously supports up to 1280 x 854 pixels on the built-in display and up to 2048 x 1536 pixels on an external display, both at millions of colors <sup>(7)</sup>
- ADC output using optional Apple DVI to ADC Adapter <sup>(6)</sup>
- Mini-DVI port (12-inch models)
- DVI output using included mini-DVI to DVI adapter (12-inch models)
- VGA output using included mini-DVI to VGA adapter (12-inch models)
- S-video and composite video output using mini-DVI to video adapter (sold separately) (12-inch models)
- DVI output port (15-inch and 17-inch models)
- VGA output using included DVI to VGA adapter (15-inch and 17-inch models)
- S-video output port (15-inch and 17-inch models)
- Composite video output using included S-video to composite adapter (15-inch and 17-inch models)

## Audio

- Audio line in (minijack)
- Headphone out (minijack)

# 82\_PowerBook G4 (12-inch 1.33GHz) - Technical Specifications.pdf

- Built-in stereo speakers with midrange-enhancing third speaker (12-inch and 15-inch models)
- Two built-in stereo speakers (17-inch model)
- Internal omnidirectional microphone

## Battery and power

- 50-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 5 hours of battery life (12-inch models) <sup>(8)</sup>
- 50-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life (15-inch models) <sup>(8)</sup>
- 58-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life (17-inch model) <sup>(8)</sup>
- 45W power adapter with cable management system (12-inch models)
- 65W power adapter with cable management system (15-inch and 17-inch models)
- Power adapter port

## Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement) and embedded keypad
- Illuminated fiber-optic, backlit keyboard with ambient light sensor (1.5GHz 15-inch model and 17-inch model, optional on 1.33GHz 15-inch model)
- Solid-state trackpad provides precise cursor control; supports tap, double-tap and drag capabilities

## Security

- Kensington cable lock slot

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 ft
- Maximum storage altitude: 15,000 ft
- Maximum shipping altitude: 35,000 ft

## Size and weight (12-inch model)

- Height: 1.18 inches (3.0 cm)
- Width: 10.9 inches (27.7 cm)
- Depth: 8.6 inches (21.9 cm)
- Weight: 4.6 pounds (2.1 kg) with battery and optical drive installed <sup>(9)</sup>

## Size and weight (15-inch models)

- Height: 1.1 inches (2.8 cm)
- Width: 13.7 inches (34.8 cm)
- Depth: 9.5 inches (24.1 cm)
- Weight: 5.7 pounds (2.6 kg) with battery and optical drive installed <sup>(9)</sup>

## Size and weight (17-inch model)

- Height: 1.0 inch (2.6 cm)
- Width: 15.4 inches (39.2 cm)
- Depth: 10.2 inches (25.9 cm)
- Weight: 6.9 pounds (3.1 kg) with battery and optical drive installed <sup>(9)</sup>

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Wireless Internet access requires AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.

3. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.

4. Burning DVDs in iDVD requires an Apple SuperDrive, but iDVD projects can be saved as an archive on PowerBook G4 models with a Combo Drive and later transferred to a SuperDrive-equipped system and burned to a DVD.

5. Actual rates will vary.

6. Connection to Apple flat-panel displays requires Apple DVI to ADC Adapter (sold separately).

7. Some third-party DVI displays may not support all resolutions. Actual resolutions and refresh rates depend on the monitor.

8. [Battery life](#) depends on configuration and use.

9. Actual weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. Product specifications are subject to change without notice.

# PowerBook G4 (15-inch 1.5/1.33GHz) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (15-inch 1.5/1.33GHz) - Technical Specifications

Configurations	12-inch Combo drive	12-inch SuperDrive	15-inch Combo drive	15-inch SuperDrive	17-inch SuperDrive
Model	M9183LL/A	M9184LL/A	M9421LL/A	M9422LL/A	M9462LL/A
Processor	1.33GHz PowerPC G4			1.5GHz PowerPC G4	
Memory	256MB PC2700 (333MHz) DDR SDRAM			512MB PC2700 (333MHz) DDR SDRAM	
Display	12.1-inch (diagonal), 1024 x 768 resolution, TFT		15.2-inch (diagonal), 1280 x 854 resolution, TFT widescreen		17-inch (diagonal), 1440 x 900 resolution, TFT widescreen
Graphics	NVIDIA GeForce FX Go5200 with 64MB of DDR SDRAM		ATI Mobility Radeon 9700 with 64MB of DDR SDRAM (available with 128MB as BTO option on 1.5GHz configurations)		
Hard disk drive <sup>(1)</sup>	60GB Ultra ATA/100			80GB Ultra ATA/100	
Slot-loading optical drive	Combo drive (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)	Combo drive (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)	
Ethernet	Built-in 10/100BASE-T		Built-in 10/100/1000BASE-T (Gigabit)		
Wireless <sup>(2)</sup>	Built-in 54-Mbps AirPort Extreme; built-in Bluetooth				
Modem <sup>(3)</sup>	Built-in 56K V.92 modem				
Keyboard	Full size			Full size, illuminated with ambient light sensor	
System software	Mac OS X v10.3 Panther				
Software	Mail, iChat, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie, Garageband and iDVD <sup>(4)</sup> ), iSync, iCal, DVD Player, Classic environment, Acrobat Reader, Art Directors Toolkit, EarthLink TotalAccess (includes 30 days of free dial-up service with Earthlink activation), FileMaker Pro Trial, GraphicConverter, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Zinio Reader, Developer Tools and Apple Hardware Test				
Video accessories	Mini-DVI to DVI adapter, mini-DVI to VGA adapter		S-video to composite adapter, DVI to VGA adapter		
Hardware accessories	Modem cable, power adapter, AC wall plug, power cord				
Limited warranty and service	Your PowerBook G4 comes with 90 days of telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> and get three years of service and support. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.				
Internet access	All models also include 30 days of free Internet service through EarthLink. Internet access requires a compatible Internet service provider; fees may apply.				
Build-to-Order Options	Order a custom-configured PowerBook G4 from the online <a href="#">Apple Store</a> or an authorized Apple reseller.				
Memory	256MB (12- and 15-inch models only), 512MB, 1GB SO-DIMMs				
Hard drive	80GB 5400-rpm drive (available only from the online Apple Store)				
Wireless	AirPort Extreme Base Station M8930LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A				
Battery and power	Apple Portable Power Adapter M8943LL/A PowerBook G4 12-inch Rechargeable Battery M9572G/A PowerBook G4 15-inch Rechargeable Battery M9325G/A PowerBook G4 17-inch Rechargeable Battery M9326G/A				
Built-in keyboard	Illuminated keyboard with ambient light sensor (1.33GHz 15-inch model only)				
External keyboard and mouse	Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269ZM/A Apple Keyboard (White) M9034LL/A Apple Mouse (White) M9035G/A				
Services	AppleCare Protection Plan M8853LL/A .Mac Subscription M9036Z/A				

### Technical Specifications

#### Processor and Memory

- 12-inch models
  - 1.33GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system



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bus

- 256MB of PC2700 (333MHz) DDR SDRAM; one open SO-DIMM slot; support for up to 1.25GB
- 15-inch models
  - 1.33GHz or 1.5GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus
  - 256MB or 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB
- 17-inch model
  - 1.5GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus
  - 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB

## Storage <sup>(1)</sup>

- 60GB 4200-rpm Ultra ATA/100 hard drive (12-inch models)
- 60GB or 80GB 4200-rpm Ultra ATA/100 hard drive (15-inch models)
- 80GB 4200-rpm Ultra ATA/100 hard drive (17-inch model)
- 80GB 5400-rpm Ultra ATA/100 hard drive available as CTO option on all models (available only from the online Apple Store)
- One of the following slot-loading optical drives
  - Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed (12- and 15-inch models)
  - SuperDrive (DVD-R/CD-RW): writes DVD-R discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 24x speed

## Communications

- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) <sup>(2)</sup>
- Built-in Bluetooth 1.1
- Built-in 10/100BASE-T Ethernet (RJ-45 connector) (12-inch models)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector) (15-inch and 17-inch models)
- Built-in 56K V.92 modem (RJ-11 connector) <sup>(3)</sup>

## Expansion

- One FireWire 400 (IEEE 1394a) port at up to 400 Mbps <sup>(5)</sup>
- One FireWire 800 (IEEE 1394b) port at up to 800 Mbps (15-inch and 17-inch models) <sup>(5)</sup>
- Two USB 2.0 ports at up to 480 Mbps
- One PC Card/CardBus slot supporting one Type I or Type II card (15-inch and 17-inch models)

## Display

- 12.1-inch (diagonal) TFT display (12-inch models)
  - Support for millions of colors at 1024 x 768 pixel resolution
  - Support for resolution scaling to 800 x 600 pixel and 640 x 480 pixel resolution with millions of colors
- 15.2-inch (diagonal) TFT display (15-inch models)
  - Support for millions of colors at 1280 x 854 pixel resolution
  - Support for resolutions of 1280 x 854 (native), 1152 x 768, 896 x 600, 720 x 480, and 640 x 480 pixels at 3:2 aspect ratio; 1024 x 768, 800 x 600 and 640 x 480 pixels at 4:3 aspect ratio
- 17-inch (diagonal) TFT display (17-inch model)
  - Support for millions of colors at 1440 x 900 pixel resolution
  - Supported resolutions: 1440 x 900 (native), 1152 x 720, 1024 x 768, 1024 x 640 and 800 x 600 pixels at 16:10 aspect ratio; 1024 x 768, 800 x 600 and 640 x 480 pixels at 4:3 aspect ratio

## Video and graphics support

- NVIDIA GeForce FX Go5200 graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory (12-inch models)
  - Dual display and video mirroring: Simultaneously supports up to 1024 x 768 pixels on the built-in display and up to 2048 x 1536 pixels on an external display, both at millions of colors <sup>(7)</sup>
- ATI Mobility Radeon 9700 graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory, optional 128MB of video memory on 1.5GHz (15- and 17-inch models)
  - Dual display and video mirroring: Simultaneously supports up to 1280 x 854 pixels on the built-in display and up to 2048 x 1536 pixels on an external display, both at millions of colors <sup>(7)</sup>
- ADC output using optional Apple DVI to ADC Adapter <sup>(6)</sup>
- Mini-DVI port (12-inch models)
- DVI output using included mini-DVI to DVI adapter (12-inch models)
- VGA output using included mini-DVI to VGA adapter (12-inch models)
- S-video and composite video output using mini-DVI to video adapter (sold separately) (12-inch models)
- DVI output port (15-inch and 17-inch models)
- VGA output using included DVI to VGA adapter (15-inch and 17-inch models)
- S-video output port (15-inch and 17-inch models)
- Composite video output using included S-video to composite adapter (15-inch and 17-inch models)

## Audio

- Audio line in (minijack)
- Headphone out (minijack)



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- Built-in stereo speakers with midrange-enhancing third speaker (12-inch and 15-inch models)
- Two built-in stereo speakers (17-inch model)
- Internal omnidirectional microphone

## Battery and power

- 50-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 5 hours of battery life (12-inch models) <sup>(8)</sup>
- 50-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life (15-inch models) <sup>(8)</sup>
- 58-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life (17-inch model) <sup>(8)</sup>
- 45W power adapter with cable management system (12-inch models)
- 65W power adapter with cable management system (15-inch and 17-inch models)
- Power adapter port

## Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement) and embedded keypad
- Illuminated fiber-optic, backlit keyboard with ambient light sensor (1.5GHz 15-inch model and 17-inch model, optional on 1.33GHz 15-inch model)
- Solid-state trackpad provides precise cursor control; supports tap, double-tap and drag capabilities

## Security

- Kensington cable lock slot

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 ft
- Maximum storage altitude: 15,000 ft
- Maximum shipping altitude: 35,000 ft

## Size and weight (12-inch model)

- Height: 1.18 inches (3.0 cm)
- Width: 10.9 inches (27.7 cm)
- Depth: 8.6 inches (21.9 cm)
- Weight: 4.6 pounds (2.1 kg) with battery and optical drive installed <sup>(9)</sup>

## Size and weight (15-inch models)

- Height: 1.1 inches (2.8 cm)
- Width: 13.7 inches (34.8 cm)
- Depth: 9.5 inches (24.1 cm)
- Weight: 5.7 pounds (2.6 kg) with battery and optical drive installed <sup>(9)</sup>

## Size and weight (17-inch model)

- Height: 1.0 inch (2.6 cm)
- Width: 15.4 inches (39.2 cm)
- Depth: 10.2 inches (25.9 cm)
- Weight: 6.9 pounds (3.1 kg) with battery and optical drive installed <sup>(9)</sup>

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Wireless Internet access requires AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.

3. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.

4. Burning DVDs in iDVD requires an Apple SuperDrive, but iDVD projects can be saved as an archive on PowerBook G4 models with a Combo Drive and later transferred to a SuperDrive-equipped system and burned to a DVD.

5. Actual rates will vary.

6. Connection to Apple flat-panel displays requires Apple DVI to ADC Adapter (sold separately).

7. Some third-party DVI displays may not support all resolutions. Actual resolutions and refresh rates depend on the monitor.

8. [Battery life](#) depends on configuration and use.

9. Actual weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. Product specifications are subject to change without notice.

# PowerBook G4 (17-inch 1.5GHz) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (17-inch 1.5GHz) - Technical Specifications

Configurations	12-inch Combo drive	12-inch SuperDrive	15-inch Combo drive	15-inch SuperDrive	17-inch SuperDrive
Model	M9183LL/A	M9184LL/A	M9421LL/A	M9422LL/A	M9462LL/A
Processor	1.33GHz PowerPC G4			1.5GHz PowerPC G4	
Memory	256MB PC2700 (333MHz) DDR SDRAM			512MB PC2700 (333MHz) DDR SDRAM	
Display	12.1-inch (diagonal), 1024 x 768 resolution, TFT		15.2-inch (diagonal), 1280 x 854 resolution, TFT widescreen		17-inch (diagonal), 1440 x 900 resolution, TFT widescreen
Graphics	NVIDIA GeForce FX Go5200 with 64MB of DDR SDRAM		ATI Mobility Radeon 9700 with 64MB of DDR SDRAM (available with 128MB as BTO option on 1.5GHz configurations)		
Hard disk drive <sup>(1)</sup>	60GB Ultra ATA/100			80GB Ultra ATA/100	
Slot-loading optical drive	Combo drive (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)	Combo drive (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)	
Ethernet	Built-in 10/100BASE-T		Built-in 10/100/1000BASE-T (Gigabit)		
Wireless <sup>(2)</sup>	Built-in 54-Mbps AirPort Extreme; built-in Bluetooth				
Modem <sup>(3)</sup>	Built-in 56K V.92 modem				
Keyboard	Full size			Full size, illuminated with ambient light sensor	
System software	Mac OS X v10.3 Panther				
Software	Mail, iChat, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie, Garageband and iDVD <sup>(4)</sup> ), iSync, iCal, DVD Player, Classic environment, Acrobat Reader, Art Directors Toolkit, EarthLink TotalAccess (includes 30 days of free dial-up service with Earthlink activation), FileMaker Pro Trial, GraphicConverter, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Zinio Reader, Developer Tools and Apple Hardware Test				
Video accessories	Mini-DVI to DVI adapter, mini-DVI to VGA adapter		S-video to composite adapter, DVI to VGA adapter		
Hardware accessories	Modem cable, power adapter, AC wall plug, power cord				
Limited warranty and service	Your PowerBook G4 comes with 90 days of telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> and get three years of service and support. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.				
Internet access	All models also include 30 days of free Internet service through EarthLink. Internet access requires a compatible Internet service provider; fees may apply.				

Build-to-Order Options	Order a custom-configured PowerBook G4 from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Memory	256MB (12- and 15-inch models only), 512MB, 1GB SO-DIMMs
Hard drive	80GB 5400-rpm drive (available only from the online Apple Store)
Wireless	AirPort Extreme Base Station M8930LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A
Battery and power	Apple Portable Power Adapter M8943LL/A PowerBook G4 12-inch Rechargeable Battery M9572G/A PowerBook G4 15-inch Rechargeable Battery M9325G/A PowerBook G4 17-inch Rechargeable Battery M9326G/A
Built-in keyboard	Illuminated keyboard with ambient light sensor (1.33GHz 15-inch model only)
External keyboard and mouse	Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269ZM/A Apple Keyboard (White) M9034LL/A Apple Mouse (White) M9035G/A
Services	AppleCare Protection Plan M8853LL/A .Mac Subscription M9036Z/A

### Technical Specifications

#### Processor and Memory

- 12-inch models
  - 1.33GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system

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bus

- 256MB of PC2700 (333MHz) DDR SDRAM; one open SO-DIMM slot; support for up to 1.25GB
- 15-inch models
  - 1.33GHz or 1.5GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus
  - 256MB or 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB
- 17-inch model
  - 1.5GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus
  - 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB

## Storage <sup>(1)</sup>

- 60GB 4200-rpm Ultra ATA/100 hard drive (12-inch models)
- 60GB or 80GB 4200-rpm Ultra ATA/100 hard drive (15-inch models)
- 80GB 4200-rpm Ultra ATA/100 hard drive (17-inch model)
- 80GB 5400-rpm Ultra ATA/100 hard drive available as CTO option on all models (available only from the online Apple Store)
- One of the following slot-loading optical drives
  - Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 16x speed, reads CDs at up to 24x speed (12- and 15-inch models)
  - SuperDrive (DVD-R/CD-RW): writes DVD-R discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 24x speed

## Communications

- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) <sup>(2)</sup>
- Built-in Bluetooth 1.1
- Built-in 10/100BASE-T Ethernet (RJ-45 connector) (12-inch models)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector) (15-inch and 17-inch models)
- Built-in 56K V.92 modem (RJ-11 connector) <sup>(3)</sup>

## Expansion

- One FireWire 400 (IEEE 1394a) port at up to 400 Mbps <sup>(5)</sup>
- One FireWire 800 (IEEE 1394b) port at up to 800 Mbps (15-inch and 17-inch models) <sup>(5)</sup>
- Two USB 2.0 ports at up to 480 Mbps
- One PC Card/CardBus slot supporting one Type I or Type II card (15-inch and 17-inch models)

## Display

- 12.1-inch (diagonal) TFT display (12-inch models)
  - Support for millions of colors at 1024 x 768 pixel resolution
  - Support for resolution scaling to 800 x 600 pixel and 640 x 480 pixel resolution with millions of colors
- 15.2-inch (diagonal) TFT display (15-inch models)
  - Support for millions of colors at 1280 x 854 pixel resolution
  - Support for resolutions of 1280 x 854 (native), 1152 x 768, 896 x 600, 720 x 480, and 640 x 480 pixels at 3:2 aspect ratio; 1024 x 768, 800 x 600 and 640 x 480 pixels at 4:3 aspect ratio
- 17-inch (diagonal) TFT display (17-inch model)
  - Support for millions of colors at 1440 x 900 pixel resolution
  - Supported resolutions: 1440 x 900 (native), 1152 x 720, 1024 x 768, 1024 x 640 and 800 x 600 pixels at 16:10 aspect ratio; 1024 x 768, 800 x 600 and 640 x 480 pixels at 4:3 aspect ratio

## Video and graphics support

- NVIDIA GeForce FX Go5200 graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory (12-inch models)
  - Dual display and video mirroring: Simultaneously supports up to 1024 x 768 pixels on the built-in display and up to 2048 x 1536 pixels on an external display, both at millions of colors <sup>(7)</sup>
- ATI Mobility Radeon 9700 graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory, optional 128MB of video memory on 1.5GHz (15- and 17-inch models)
  - Dual display and video mirroring: Simultaneously supports up to 1280 x 854 pixels on the built-in display and up to 2048 x 1536 pixels on an external display, both at millions of colors <sup>(7)</sup>
- ADC output using optional Apple DVI to ADC Adapter <sup>(6)</sup>
- Mini-DVI port (12-inch models)
- DVI output using included mini-DVI to DVI adapter (12-inch models)
- VGA output using included mini-DVI to VGA adapter (12-inch models)
- S-video and composite video output using mini-DVI to video adapter (sold separately) (12-inch models)
- DVI output port (15-inch and 17-inch models)
- VGA output using included DVI to VGA adapter (15-inch and 17-inch models)
- S-video output port (15-inch and 17-inch models)
- Composite video output using included S-video to composite adapter (15-inch and 17-inch models)

## Audio

- Audio line in (minijack)
- Headphone out (minijack)

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- Built-in stereo speakers with midrange-enhancing third speaker (12-inch and 15-inch models)
- Two built-in stereo speakers (17-inch model)
- Internal omnidirectional microphone

## Battery and power

- 50-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 5 hours of battery life (12-inch models) <sup>(8)</sup>
- 50-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life (15-inch models) <sup>(8)</sup>
- 58-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life (17-inch model) <sup>(8)</sup>
- 45W power adapter with cable management system (12-inch models)
- 65W power adapter with cable management system (15-inch and 17-inch models)
- Power adapter port

## Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement) and embedded keypad
- Illuminated fiber-optic, backlit keyboard with ambient light sensor (1.5GHz 15-inch model and 17-inch model, optional on 1.33GHz 15-inch model)
- Solid-state trackpad provides precise cursor control; supports tap, double-tap and drag capabilities

## Security

- Kensington cable lock slot

## Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 113° F (-25° to 45° C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 ft
- Maximum storage altitude: 15,000 ft
- Maximum shipping altitude: 35,000 ft

## Size and weight (12-inch model)

- Height: 1.18 inches (3.0 cm)
- Width: 10.9 inches (27.7 cm)
- Depth: 8.6 inches (21.9 cm)
- Weight: 4.6 pounds (2.1 kg) with battery and optical drive installed <sup>(9)</sup>

## Size and weight (15-inch models)

- Height: 1.1 inches (2.8 cm)
- Width: 13.7 inches (34.8 cm)
- Depth: 9.5 inches (24.1 cm)
- Weight: 5.7 pounds (2.6 kg) with battery and optical drive installed <sup>(9)</sup>

## Size and weight (17-inch model)

- Height: 1.0 inch (2.6 cm)
- Width: 15.4 inches (39.2 cm)
- Depth: 10.2 inches (25.9 cm)
- Weight: 6.9 pounds (3.1 kg) with battery and optical drive installed <sup>(9)</sup>

1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Wireless Internet access requires AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.

3. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.

4. Burning DVDs in iDVD requires an Apple SuperDrive, but iDVD projects can be saved as an archive on PowerBook G4 models with a Combo Drive and later transferred to a SuperDrive-equipped system and burned to a DVD.

5. Actual rates will vary.

6. Connection to Apple flat-panel displays requires Apple DVI to ADC Adapter (sold separately).

7. Some third-party DVI displays may not support all resolutions. Actual resolutions and refresh rates depend on the monitor.

8. [Battery life](#) depends on configuration and use.

9. Actual weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. Product specifications are subject to change without notice.

# eMac (USB 2.0) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## eMac (USB 2.0) - Technical Specifications

Configurations	Combo Drive	SuperDrive
Model	M9425LL/A	M9461LL/A
Processor	1.25GHz PowerPC G4	
System bus	167MHz	
Memory	256MB of PC2700 (333MHz) DDR SDRAM; supports up to 1GB	
Hard disk drive (2)	40GB Ultra ATA/100	80GB Ultra ATA/100
Optical drive	Combo (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)
Display	17-inch (16-inch viewable) flat CRT	
Graphics support	ATI Radeon 9200; 32MB dedicated DDR SDRAM video memory	
VGA video mirroring (3)	Yes (Apple VGA Display Adapter required, sold separately)	
S-video and composite video output (3)	Yes (Apple Video Adapter required, sold separately)	
Ports	Two FireWire 400 ports, three USB 2.0 ports (on computer), two USB 1.1 ports (on keyboard), mini-VGA output port, headphone jack, audio line in jack	
Networking	Built-in 10/100BASE-T Ethernet and 56K V.92 modem (4)	
Wireless Networking (1)	AirPort Extreme ready; internal Bluetooth module available as build-to-order option	
Speakers	Integrated stereo speakers	
System software	Mac OS X version 10.3 "Panther"	
Software	Classic environment, Mail, iChat AV, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie, iDVD(6), GarageBand), iSync, iCal, DVD Player, AppleWorks, Microsoft Internet Explorer, EarthLink (includes 30 days of free dial-up service with activation), Quicken 2004 for Mac,World Book 2004 Edition, Sound Studio,Tony Hawk's Pro Skater 4, Deimos Rising, Zinio Reader, Apple Hardware Test	
Hardware Accessories	Apple Keyboard, Apple Mouse, modem cable	
Service and support	Your eMac comes with 90 days of telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> and get three years of service and support. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.	

Build-to-Order Options	Order a custom-configured eMac from the online <a href="#">Apple Store</a> or an authorized Apple reseller.
Memory	512MB, 1GB
Hard Drive (2)	Up to 160GB
Wireless	AirPort Extreme Card M8881LL/A AirPort Extreme Base Station >M8930LL/A AirPort Extreme Base Station with modem and antenna port M8799LL/A Internal Bluetooth module D-Link USB Bluetooth Adapter T6295ZM/A
Video adapters	Apple Video Adapter M9109G/A Apple VGA Display Adapter M8639G/A
Accessories	eMac Tilt and Swivel Stand >M8784G/A Apple FireWire Cable (4-pin to 6-pin) M8706G/A Apple 8x DVD-R Media Kit M9472G/A
Services	AppleCare Protection Plan M8851LL/A .Mac M9036Z/A

### Technical Specifications

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## Processor and memory

- 1.25GHz PowerPC G4 processor with Velocity Engine
- 512K on-chip level 2 cache at full processor speed
- 167MHz system bus
- 256MB of PC2700 (333MHz) DDR SDRAM, expandable up to 1GB; two user-accessible 184-pin DIMM slots support up to 1GB using 256MB or 512MB DIMMs

## Storage

- 40GB or 80GB Ultra ATA/100 hard disk drive (2)
- One of the following optical drives:
  - Combo drive (DVD-ROM/CD-RW); reads DVDs at up to 12x speed, writes CD-R discs at up to 32x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 32x speed
  - SuperDrive (DVD-R/CD-RW); writes DVD-R discs at up to 8x speed, reads DVDs at up to 10x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 32x speed

## Communications

- Built-in 56K V.92 modem (RJ-11 connector) (4)
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and expansion slot for optional 54-Mbps AirPort Extreme Card (based on IEEE 802.11g; WiFi Certified for 802.11g and 802.11b interoperability) (1)
- Optional internal Bluetooth module

## Display

- Built-in 17-inch flat CRT (16-inch viewable image size); 0.25-mm dot pitch

## Video

- Mini-VGA output port (requires Apple VGA Display Adapter sold separately)
- VGA output resolutions:
  - 640 by 480 pixels at 60Hz, 67Hz, 72Hz, 75Hz, 85Hz, 90Hz, 100Hz and 120Hz
  - 800 by 600 pixels at 56Hz, 60Hz, 72Hz, 75Hz, 85Hz, 90Hz, 100Hz and 120Hz
  - 1024 by 768 pixels at 60Hz, 70Hz, 75Hz, 85Hz, 90Hz and 100Hz
  - 1152 by 870 pixels at 75Hz
  - 1280 by 960 pixels at 75Hz
- S-video and composite video output to connect directly to a TV or projector (requires Apple Video Adapter, sold separately)
- Support for video mirroring: external devices display an image identical to that shown on the built-in display

## Graphics support

- ATI Radeon 9200 graphics processor with AGP 4X support
- 32MB of dedicated Double Data Rate (DDR) SDRAM video memory
- Five screen resolutions: 640 by 480 pixels, 800 by 600 pixels, 1024 by 768 pixels, 1152 by 864 pixels and 1280 by 960 pixels

## Peripheral connections

- Two FireWire 400 ports; 8 watts shared
- Total of five USB ports: three USB 2.0 ports on computer (up to 480 Mbps); two USB 1.1 ports on keyboard

## Audio

- Integrated high-performance stereo audio system
- Internal 16-watt digital amplifier
- Headphone jack (headphones not included)
- Audio line in jack
- Built-in microphone

## Electrical and environmental requirements

- Meets ENERGY STAR requirement
- Line voltage: configured for 100-120V AC or 200-240V AC depending on country of use
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 230W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Size and weight

- Height: 15.8 inches (40.6cm)
- Width: 15.8 inches (40.6cm)
- Depth: 17.1 inches (43.3cm)
- Weight: 50 pounds (22.7kg) (5)

1. Wireless Internet access requires AirPort Extreme Card, AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions. Achieving data rates up to 54Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Wireless printing over USB requires Mac OS X v10.2.7 or later and a compatible printer.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Requires adapter, sold separately.
4. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.
5. Weight varies by configuration and manufacturing process.
6. iDVD requires an Apple Combo drive or SuperDrive.

Published Date: Apr 6, 2016

# Xserve G5 - Technical Specifications

Hardware			
Configurations	Single Processor M9743LL/A	Dual Processor M9745LL/A	Cluster Node M9742LL/A
Processor	Single 2.0GHz PowerPC G5		Dual 2.3GHz PowerPC G5
Frontside bus	1GHz		1.15GHz per processor
On-chip L2 cache	512K per processor		
ECC memory	1GB, 16GB Maximum		512MB, 16GB Maximum
Hot-plug storage (1)	One 80GB Serial ATA Apple Drive Module; support for up to 1.5TB (2) in three drive bays		One drive bay with 80GB Serial ATA Apple Drive Module
Hardware RAID	Optional		N/A
Optical drive	Slot-loading Combo (DVD-ROM/CD-RW) or optional SuperDrive(DVD-R/CD-RW)		N/A
I/O connectivity	Two built-in Gigabit Ethernet interfaces (10/100/1000 BASE-T RJ-45); two FireWire 800, one FireWire 400, two USB 2.0, one DB-9 (RS-232) serial port		
PCI slots	Two full-length 64-bit PCI-X slots; supports 1 card at 133MHz or 2 at 100MHz		
PCI expansion options (5)	<ul style="list-style-type: none"><li>Apple Fibre Channel PCI-X card (for connecting to Xserve RAID)</li><li>Hardware RAID PCI card</li><li>Gigabit Ethernet PCI-X card</li><li>Dual channel 320 SCSI PCI-X card</li><li>PCI video card with VGA connector</li></ul>		
Service and Support	90 days of free telephone support and one-year limited warranty, optional AppleCare Support plans are available.		
Also included	Mounting screws with M5 and 10/32-inch threads; caged nuts; cable management arm for four-post racks; agency-approved 12-foot power cable		

Software			
Configurations	Single Processor M9743LL/A	Dual Processor M9745LL/A	Cluster Node M9742LL/A
Mac OS X Server 10.4	Unlimited-Client Edition		10-Client Edition
Included services	<ul style="list-style-type: none"><li>File and printer sharing: Macintosh (AFP, PAP, IPP), Windows (SMB/CIFS, IPP), UNIX and Linux (NFS, LPR/LPD), Internet (FTP, WebDAV)</li><li>Directory services: Open Directory (OpenLDAP, Kerberos, SASL), NT Domain Services (Samba 3), Backup Domain Controller (BDC)</li><li>Mail services: Postfix (SMTP), Cyrus (IMPAP, POP); webmail (SquirrelMail), mailing lists (Mailman), junk mail filtering (SpamAssassin), virus detection and quarantine (ClamAV)</li><li>Web hosting: Apache web server, JBoss application server (EJB), Apache Tomcat (JSPs, Servlets), MySQL</li><li>Media streaming: QuickTime Streaming Server (H.264, 3GPP, MPEG-4, MP3, AAC, RTP/RTSP), QuickTime Broadcaster, QTSS Publisher</li><li>Collaboration services: iChat Server, Weblog Server</li><li>Desktop management: Workgroup Manager, NetBoot, Network Install, Software Update Server</li><li>Network and security: DNS, DHCP, NAT, FireWall (IPFW2), VPN server (L2TP, PPTP), NTP</li><li>Management tools: Server Monitor (for Xserve hardware monitoring), Server Admin, Secure Shell (SSH2), SNMPv3</li><li>Distributed computing: Xgrid</li></ul>		

Physical Specifications			
Configurations	Single Processor M9743LL/A	Dual Processor M9745LL/A	Cluster Node M9742LL/A
Rack support	<ul style="list-style-type: none"><li>Fits EIA-310-D-compliant, industry-standard 19-inch-wide racks, including four-post racks (24 inches, 26 inches, and from 29 to 36 inches deep) and two-post telco racks (center-mount brackets included)</li><li>Cable management arm for four-post rack</li><li>Front-to-back cooling for rack enclosure</li></ul>		



# 86\_Xserve G5 - Technical Specifications.pdf

<b>Electrical and environmental requirements</b>	<ul style="list-style-type: none"><li>■ Line voltage: universal input (90V to 264V AC), power factor corrected</li><li>■ Maximum input current: 4A (90V to 115V) or 2A (180V to 264V)</li><li>■ Frequency: 47Hz to 63Hz, single phase</li><li>■ Output power: 400W</li><li>■ Operating temperature: 50° to 95° F (10° to 35° C)</li><li>■ Storage temperature: -40° to 116° F (-40° to 47° C)</li><li>■ Maximum altitude: 10,000 feet</li><li>■ FCC Class A approved</li></ul>
<b>Size and weight</b>	<ul style="list-style-type: none"><li>■ 1.73 inches (4.4 cm) high by 17.6 inches (44.7 cm) wide by 28 inches (71.1 cm) deep</li><li>■ 33 pounds (15.1 kg); 37 pounds (16.6 kg) with three Apple Drive Modules</li></ul>

1. For hard drive capacity measurements, 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
2. Maximum capacity of 1.5TB achieved through use of three 500GB Apple Drive Modules.
3. Actual rates will vary.
4. Weight varies by configuration and manufacturing process.
5. PCI expansion options not available for Xserve G5 Cluster Node Build-To-Order.

Product specifications are subject to change without notice.

Published Date: Jul 26, 2017



# Xserve RAID (SFP) - Technical Specifications

Configurations			
Order No.	1TB Xserve RAID M9721LL/A	3.5TB Xserve RAID MA208LL/A	7TB Xserve RAID MA209LL/A
Ultra ATA Apple Drive Modules (7200 rpm)	Four 250GB drives	Seven 500GB drives	Fourteen 500GB drives
Controller cache	512MB per controller		
Total available storage -RAID 0 <sup>(1)</sup>	1TB	3.5TB	7TB
Usable storage -RAID 1 <sup>(1)</sup>	500GB	1.5TB	3TB
Usable storage -RAID 3 and 5 <sup>(1)</sup>	750GB	3TB	6TB
On-drive cache	8MB per drive	8MB per drive	8MB per drive
Expansion	Fourteen bays with independent 100MB/s ATA channels for up to 7TB of storage		
Also included	M5, M6 and 10/32-inch mounting screws; caged nuts; two agency-approved 12-foot power cables		
Service and support	90 days of free telephone support and one-year limited warranty. Optional <a href="#">AppleCare Support</a> plans are available.		

Specifications	
RAID controllers and cache memory	<ul style="list-style-type: none"><li>■ Dual independent controllers, each with environment management coprocessor for out-of-band remote management and monitoring</li><li>■ 512MB of cache per controller (1GB total)</li><li>■ Cache Backup Battery Modules (sold separately) for over 72 hours of memory protection</li></ul>
RAID operation	<ul style="list-style-type: none"><li>■ Support for RAID levels: 0, 1, 3, 5, 0+1,10, 30, 50 (10, 30 and 50 require host-based software RAID)</li><li>■ Support for multiple RAID sets, multiple hosts and LUN masking and mapping</li><li>■ Background RAID set creation; automatic variable background rebuilding; online expansion; LUN slicing; global drive hot sparing (per RAID controller) <sup>(2)</sup></li></ul>
Fibre Channel storage-to-host connection	<ul style="list-style-type: none"><li>■ Dual 2Gb Fibre Channel ports (SFP), 200MB/s throughput per channel with guaranteed delivery (400MB/s full duplex) <sup>(3)</sup></li><li>■ Host connectivity using 2Gb Apple Fibre Channel PCI-X Card or Apple Fibre Channel PCI Express Card (cards sold separately) or compatible third-party PCI card</li><li>■ Support for point-to-point, loop and fabric (switched) topologies</li><li>■ Dual 10/100BASE-T Ethernet for remote management</li></ul>
Apple Fibre Channel PCI Express Card (sold separately)	<ul style="list-style-type: none"><li>■ Dual-channel 2Gb Fibre Channel PCI Express Bus Adapter</li><li>■ Runs at full bandwidth in a four-lane or eight-lane PCI Express slot on the new Power Mac G5; not compatible with PCI or PCI-X</li><li>■ Two 2.9-meter Fibre Channel copper cables with embedded SFP transceivers; compatible with SFP fiber-optic cables and transceivers</li></ul>
Apple Fibre Channel PCI-X Card (sold separately)	<ul style="list-style-type: none"><li>■ 64-bit, 133MHz card with two SFP 2Gb Fibre Channel ports; compatible with 32-bit, 66MHz PCI slots and 64-bit, 100 MHz or 133 MHz PCI-X slots</li><li>■ Two 2.9-meter Fibre Channel copper cables with embedded SFP transceivers; compatible with SFP fiber-optic cables and transceivers</li></ul>
Supported SFP Types	<p>Short-Haul Transceiver (supports up to 500m with 50/125 m MMF)</p> <ul style="list-style-type: none"><li>■ Finisar FTRJ-8519-P1BNL</li><li>■ Pico Light PL-XPL-VE-S24-11</li><li>■ Pico Light PL-XPL-VC-S23-11</li><li>■ JDS Uniphase JSM-21S0AA1</li><li>■ JDS Uniphase JSP-21S0AA1</li></ul> <p>Long-Haul Transceiver (supports up to 10km with 9/125 m SMF)</p> <ul style="list-style-type: none"><li>■ Finisar FTRJ-1319-P1BTL</li></ul>

Cooling	<ul style="list-style-type: none"><li>■ Redundant hot-swap cooling modules with self-regulating speeds and front-to-back cooling</li><li>■ Environmental monitoring system for automatically maintaining optimal ambient temperature</li></ul>
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# 87\_Xserve RAID (SFP) - Technical Specifications.pdf

Electrical requirements	<ul style="list-style-type: none"><li>■ Redundant load-sharing hot-swap power supplies (450W); universal input (100V to 240V AC), power factor corrected</li><li>■ Maximum input current: 7.6A (100V to 127V) or 3.6A (200V to 240V)</li><li>■ Power usage: 300W typical continuous power, 400W maximum continuous power</li><li>■ Dual DB-9 serial ports for UPS systems</li><li>■ Frequency: 50Hz to 60Hz, single phase</li></ul>
Environmental requirements	<ul style="list-style-type: none"><li>■ Operating temperature: 50° to 95° F (10° to 35° C)</li><li>■ Storage temperature: -40° to 116° F ( -40° to 47° C)</li><li>■ Relative humidity: 5% to 95% noncondensing</li><li>■ Maximum thermal output: 1365 BTUs per hour</li><li>■ Maximum altitude: 10,000 feet</li><li>■ FCC Class A approved</li></ul>
Size and weight	<ul style="list-style-type: none"><li>■ 3U rack-optimized: 5.25 inches (13.3 cm) high by 17 inches (43.2 cm) wide by 18.4 inches (46.7 cm) deep</li><li>■ Fits EIA-310-D-compliant industry-standard 19-inch-wide four-post racks from 24 to 36 inches deep; deeper racks require third-party extender</li><li>■ 60-100 pounds (27-45 kg), depending on configuration (4)</li></ul>

1. For hard drive capacity measurements, 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
2. Automatic rebuild requires a designated hot spare; not available for RAID level 0.
3. Actual rates will vary depending on configuration and RAID level.
4. Weight varies by configuration and manufacturing process.

Product specifications are subject to change without notice.

Published Date: Jul 26, 2017

# iPod mini and iPod mini (Second Generation) - Technical Specifications

## iPod mini and iPod mini (Second Generation) - Technical Specifications

iPod mini Configurations	4GB (First Generation)	4GB (Second Generation)	6GB (Second Generation)
Order no.	M9160LL/A (silver) M9437LL/A (gold) M9436LL/A (blue) M9435LL/A (pink) M9434LL/A (green)	M9800 (silver) M9802 (blue) M9804 (pink) M9806 (green)	M9801 (silver) M9803 (blue) M9805 (pink) M9807 (green)
Storage	4GB(1)6GB(1)		
Battery life	Up to 8 hours(4)Up to 18 hours(4)		
Skip protection	Up to 25 minutes		
Display	1.67-inch (diagonal) grayscale LCD with LED backlight		
Ports	Dock connector, remote connector, stereo minijack		
Connectivity	FireWire 400 and USB 2.0(3)through dock connector	USB 2.0 and FireWire 400 (optional cable) through dock connector	
Charge time	3 hours (1-hour fast charge to 80% capacity)	About 4 hours (2-hour fast charge to 80% capacity)	
Audio support	AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible, AIFF and WAV	AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible, AIFF, Apple Lossless and WAV	
Size	3.6 x 2.0 x .54 inches (9.1 x 5.1 x 1.3 cm)		
Weight	3.6 ounces		
Included software	iTunes for Mac, iTunes for Windows(5)		
Included accessories	Earbud headphones, belt clip, AC adapter, FireWire cable, USB 2.0 cable	Earbud headphones, Dock Connector to USB 2.0 cable, iPod mini Belt Clip	
Optional accessories	Remote model: M9128G/A Dock: iPod mini Dock (M9467G/A) iPod Stereo Connection Kit with Monster Cable: compatible Dock with M9339 and M9339 iPod Power Adapter (FireWire) (M8636G/C) iPod USB Power Adapter (M9837LL/A) FireWire Cable Kit (4-pin to 6-pin) (M8706G/A) iPod Dock Connector to FireWire Cable (M9127G/A) iPod Dock Connector to USB 2.0 Cable (M9569G/A): included Apple World Traveler Adapter Kit (requires iPod Power Adapter or iPod USB Power Adapter) iPod Lanyard (M9568G/A) iPod mini Armbands (multiple colors)		
Mac requirements	Macintosh computer with FireWire port; Mac OS X v10.1.5 or later (Mac OS X 10.3 or later recommended)	Mac OS X 10.2.8 or Mac OS X 10.3.4 or later (Mac OS X 10.3.4 or later recommended); USB 2.0 requires Mac OS X v10.3.4 or later; Macintosh with built-in FireWire port or built-in USB 2.0 port.	
Windows requirements	PC with FireWire or USB 2.0 port, or FireWire or USB 2.0 card; Windows 2000 with Service Pack 4 or Windows XP Home or Professional	PC with FireWire or USB 2.0 port, or FireWire or USB 2.0 card; Windows 2000 (Service Pack 4 or later) or Windows XP Home or Professional (Service Pack 2 or later)	
Documentation and support	Electronic documentation, getting started guide and one-year limited warranty		
Limited warranty and service	Your iPod comes with single incident telephone support for the first 90 days and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> for iPod to extend your service and support to two full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.		

Options & Accessories			
iPod mini Dock	M9467G/A	FireWire Cable	M9127G/A
Remote & Earbud Headphones	M9128G/A	In-Ear Headphones	M9394G/A
Carrying Case with Belt Clip	M9129G/A	iPod mini Armband	M9445G/A
iPod Stereo Connection Kit	M9339LL/A	World Travel Adapter Kit	M8794LG/A
AppleCare Protection Plan	M9404LL/A		

<div><b>Capacity</b><ul style="list-style-type: none"><li>■ 4GB hard disk drive<sup>(1)</sup><ul style="list-style-type: none"><li>◦ Holds 1,000 songs in 128-Kbps AAC format<sup>(2)</sup></li><li>◦ Stores data via FireWire or USB 2.0<sup>(3)</sup> hard drive</li></ul></li></ul></div> <div><b>Customizable settings</b><ul style="list-style-type: none"><li>■ Customize main menu</li><li>■ Create On-The-Go playlists</li><li>■ Rate songs</li><li>■ Shuffle songs or albums</li><li>■ Repeat one or all</li><li>■ Sound Check on or off</li><li>■ 20 Equalizer settings</li><li>■ Backlight timer</li><li>■ Display contrast</li><li>■ Alarms on, off or silent</li><li>■ Sleep timer</li><li>■ Date and time</li><li>■ Display time in menu bar</li><li>■ Contacts sort and display by first or last names</li><li>■ Clicker on or off</li><li>■ Languages: English, French, German, Japanese, Spanish, Italian, Dutch, Danish, Norwegian, Finnish, Swedish, Korean, Simplified Chinese, Traditional Chinese</li></ul></div> <div><b>Display (4GB model)</b><ul style="list-style-type: none"><li>■ 1.67 inch (diagonal) liquid crystal display with blue-white LED backlight</li><li>■ 138-by-110-pixel resolution, 0.22-mm dot pitch</li><li>■ Support for display of multiple languages and characters simultaneously</li></ul></div>	<div><b>Size and weight (4GB model)</b><ul style="list-style-type: none"><li>■ Height: 3.6 in</li><li>■ Width: 2.0 in</li><li>■ Depth: 0.5 in</li><li>■ Weight: 3.6 oz (104 g)</li></ul></div> <div><b>Audio</b><ul style="list-style-type: none"><li>■ Up to 25 minutes of skip protection</li><li>■ Frequency response: 20 Hz to 20,000 Hz</li><li>■ Audio formats supported: AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible, AIFF (Mac only) and WAV</li><li>■ Upgradable firmware enables support for future audio formats</li></ul></div> <div><b>Headphones</b><ul style="list-style-type: none"><li>■ Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets</li><li>■ Frequency response: 20Hz to 20,000Hz</li><li>■ Impedance: 32 ohms</li></ul></div> <div><b>Input and output</b><ul style="list-style-type: none"><li>■ Dock connector</li><li>■ 3.5-mm stereo headphone jack</li><li>■ Wired remote connector</li></ul></div>	<div><b>Environmental requirements</b><ul style="list-style-type: none"><li>■ Operating temperature: 32° to 95° F (0° to 35° C)</li><li>■ Non operating temperature: -4° to 113° F (-20° to 45° C)</li><li>■ Relative humidity: 5% to 95% noncondensing</li><li>■ Maximum operating altitude: 10,000 feet (3000 m)</li></ul></div> <div><b>Power and battery</b><ul style="list-style-type: none"><li>■ Built-in rechargeable lithium ion battery</li><li>■ Playtime: 8 hours when fully charged</li><li>■ Standby time: 1 month when fully charged</li><li>■ Charging via FireWire to computer system or power adapter<ul style="list-style-type: none"><li>◦ Fast-charge time: 1 hour (charges up to 80% of battery capacity)</li><li>◦ Full-charge time: 3 hours</li></ul></li><li>■ Charging via USB 2.0 to computer system or power adapter (iPod mini only)<ul style="list-style-type: none"><li>◦ Fast-charge time: 1 hour (charges up to 80% of battery capacity)</li><li>◦ Full-charge time: 3 hours</li></ul></li></ul></div> <div><b>Power adapter</b><ul style="list-style-type: none"><li>■ 6-pin FireWire connector</li><li>■ AC input: 100V to 240V at 0.4 amp maximum</li><li>■ Frequency: 50Hz to 60Hz</li><li>■ DC output: 12V at 1 amp maximum</li></ul></div>
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<b>Capacity</b> <ul style="list-style-type: none"><li>4 GB or 6 GB hard disk drive<sup>(1)</sup><ul style="list-style-type: none"><li>Holds up to 1000 (4 GB) or up to 1500 (6 GB) songs in 128-Kbps AAC format<sup>(2)</sup></li><li>Stores data via FireWire or USB 2.0<sup>(3)</sup> hard drive</li></ul></li></ul> <b>Size and weight</b> <ul style="list-style-type: none"><li>Height: 3.6 in</li><li>Width: 2.0 in</li><li>Depth: 0.54 in</li><li>Weight: 3.6 oz (158 g)</li></ul> <b>Display</b> <ul style="list-style-type: none"><li>1.67-inch (diagonal) liquid crystal display with blue-white LED backlight</li><li>138-by-110-pixel resolution, 0.22-mm dot pitch</li><li>Support for display of multiple languages and characters simultaneously</li></ul> <b>Audio</b> <ul style="list-style-type: none"><li>Up to 25 minutes of skip protection</li><li>Frequency response: 20Hz to 20,000Hz</li><li>Audio formats supported: AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible, AIFF, Apple Lossless and WAV</li><li>Upgradable firmware enables support for future audio formats</li></ul>	<b>Customizable settings (iPod)</b> <ul style="list-style-type: none"><li>Customize main menu</li><li>Create multiple On-The-Go playlists</li><li>Adjust audiobook playback speed</li><li>Clicker playback through headphones</li><li>Rate songs</li><li>Shuffle songs or albums</li><li>Repeat one or all</li><li>Sound Check on or off</li><li>20 Equalizer settings</li><li>Backlight timer</li><li>Display contrast</li><li>Alarms on, off or silent</li><li>Sleep timer</li><li>Date and time</li><li>Display time in menu bar</li><li>Contacts sort and display by first or last names</li><li>Clicker on or off</li><li>Menu Languages: English, French, German, Japanese, Spanish, Italian, Dutch, Danish, Norwegian, Finnish, Swedish, Korean, Simplified Chinese, Traditional Chinese.</li><li>Display Song, Artist and Album Info in: Bulgarian, Croatian, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Slovenian, Simplified Chinese, Spanish, Swedish, Traditional Chinese, Turkish and Ukrainian.</li></ul> <b>Customizable settings (iPod mini)</b> <ul style="list-style-type: none"><li>Customize main menu</li><li>Create On-The-Go playlists</li><li>Rate songs</li><li>Shuffle songs or albums</li><li>Repeat one or all</li><li>Sound Check on or off</li><li>20 Equalizer settings</li><li>Backlight timer</li><li>Display contrast</li><li>Alarms on, off or silent</li><li>Sleep timer</li><li>Date and time</li><li>Display time in menu bar</li><li>Contacts sort and display by first or last names</li><li>Clicker on or off</li><li>Menu Languages: English, French, German, Japanese, Spanish, Italian, Dutch, Danish, Norwegian, Finnish, Swedish, Korean, Simplified Chinese, Traditional Chinese.</li></ul>	<b>Headphones</b> <ul style="list-style-type: none"><li>Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets</li><li>Frequency response: 20Hz to 20,000Hz</li><li>Impedance: 32 ohms</li></ul> <b>Input and output</b> <ul style="list-style-type: none"><li>Dock connector</li><li>3.5-mm stereo headphone jack</li><li>Wired remote connector</li></ul> <b>Environmental requirements</b> <ul style="list-style-type: none"><li>Operating temperature: 32° to 95° F (0° to 35° C)</li><li>Non operating temperature: -4° to 113° F (-20° to 45° C)</li><li>Relative humidity: 5% to 95% noncondensing</li><li>Maximum operating altitude: 10,000 feet (3000 m)</li></ul> <b>Power and battery</b> <sup>(3)</sup> <ul style="list-style-type: none"><li>Built-in rechargeable lithium ion battery</li><li>iPod playtime: Up to 18 hours when fully charged</li><li>Standby time: 1 month when fully charged</li><li>Charging via FireWire to computer system or power adapter (optional)<ul style="list-style-type: none"><li>Fast-charge time: about 2 hours for iPod (charges up to 80% of battery capacity)</li><li>Full-charge time: about 4 hours</li></ul></li><li>Charging via USB 2.0 to computer system or power adapter (optional)<ul style="list-style-type: none"><li>Full-charge time: about 4 hours</li></ul></li></ul>
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1. 1GB = 1 billion bytes; actual formatted capacity less.

2. Capacity based on 4 minutes per song and 128-Kbps AAC encoding.

3. USB 2.0 connection is for Windows PCs only or Mac OS X 10.3.4 or later; USB 2.0 cable is included with iPod mini.

4. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

5. iPod and iTunes are for legal or rightholder-authorized copying only. Don't steal music.

# iBook G4 - Technical Specifications

This article has been archived and is no longer updated by Apple.

Configurations			
Order number	12-inch Combo Drive M9164LL/A	14-inch Combo Drive M9388LL/A	14-inch Combo Drive M9165LL/A
Processor	800MHz PowerPC G4	933MHz PowerPC G4	1GHz PowerPC G4
Level 2 Cache	256K at 800MHz	256K at 933MHz	256K at 1GHz
System bus	133MHz		
Memory (DDR SDRAM)	256MB, expandable to 640MB		
Hard drive(5)	30GB Ultra ATA	40GB Ultra ATA	60GB Ultra ATA
Optical drive	Slot-loading Combo (DVD-ROM/CD-RW)		
Display	12.1-inch (diagonal) TFT XGA	14.1-inch (diagonal) TFT XGA	
Graphics support	ATI Mobility Radeon 9200 with 32MB of DDR SDRAM		
FireWire	One FireWire 400 port at up to 400 Mbps		
USB	Two USB 2.0 ports (480-Mbps each)		
VGA, S-video and composite video output	Video mirroring supports VGA video out to an external display or projector (requires included Apple VGA Video Adapter) and S-video and composite video out to a TV or VCR (requires optional Apple Video Adapter, sold separately).		
Modem (6)	Built-in 56K V.92 modem		
Ethernet	Built-in 10/100BASE-T Ethernet		
Wireless support (3)	AirPort Extreme ready; optional internal Bluetooth module available		
System Software	Mac OS X version 10.3 "Panther"		
Software	All models include Mail, Safari, iChat AV, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, and iMovie), iSync, iCal, DVD Player, AppleWorks, Mac OS X Chess, and Classic environment; Microsoft Internet Explorer, AOL, Quicken 2004 Deluxe, World Book 2003 Edition, Microsoft Office 4.X Test Drive, Tony Hawk's Pro Skater 4, Deimos Rising, Sound Studio, and Zinio Reader; Apple Hardware Test.		
Service and Support	90 days of free telephone support and one-year limited warranty. Product contains documentation. Backup copy of software is provided on CD-ROM.		
Internet Access	30 days of free dial-up Internet service with EarthLink (North America only) activation. Internet access requires an Internet service account; fees may apply.		

Build-to-Order Options	
Order a custom-configured computer from the online Apple Store or an Apple Authorized reseller.	
Wireless	AirPort Extreme Card M8881LL/A AirPort Extreme Base Station M8930LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A Bluetooth T6295ZM/A
Adapters and cables	Apple Video Adapter M9109G/A Apple VGA Display Adaptor M8639G/A Apple FireWire Cable (4-pin to 6-pin, 1.8 meter) M8706G/A
Battery and power	Apple Portable Power Adapter M8943LL/A iBook Rechargeable Battery (12.1-inch iBook with CD-ROM) M9337G/A iBook Rechargeable Battery (14.1-inch iBook) M9338G/A
Accessories	Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269ZM/A Apple Keyboard (White) M9034LL/A Apple Mouse (White) M9035G/A iSight M8817LL/A
Services	AppleCare Protection Plan M8852LL/A .Mac Subscription: Retail Box MA175Z/A or Family Pack MA176Z/A

Technical Specifications

Processor and memory

- 800MHz, 933MHz or 1GHz PowerPC G4 processor with Velocity Engine and 256K on-chip level 2 cache running at full processor speed
- 133 MHz system bus
- 256MB of PC2100 (266MHz) DDR SDRAM (128MB built-in and 128MB in SO-DIMM slot) with support for up to 640MB

Storage

- 30GB, 40GB or 60GB Ultra ATA hard disk drive (5)
- Combo drive (DVD-ROM/CD-RW); writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 10x speed, reads DVD-ROM discs at up to 8x speed, reads CD-ROM discs at up to 24x speed
- Support for external FireWire and USB storage devices

Display

- Choice of built-in 12.1-inch or 14.1-inch (diagonal) TFT XGA active-matrix display
- Support for millions of colors at 1024-by-768-pixel resolution
- Support for resolution scaling to 800-by-600-pixel and 640-by-480-pixel resolution with millions of colors

Graphics support

- ATI Mobility Radeon 9200 graphics processor with 32MB of dedicated video memory and AGP 4X support

Communications

- Built-in 56K V.92 modem (RJ-11 connector) (6)
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and expansion slot for optional 54-Mbps AirPort Extreme Card; (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability (3))

Peripheral connections

- Two 480 Mbps USB 2.0 ports
- One FireWire 400 port at up to 400 Mbps (7)

Audio

- 16-bit CD-quality stereo headphone jack
- Built-in stereo speakers
- Built-in microphone
- Support for external USB audio devices such as microphones and speakers

Video

- VGA video output for video mirroring on an external display or projector (24-bit color) with included Apple VGA Display Adapter.
- S-video and composite video output to TV or projector (requires Apple Video Adapter, sold separately)

Battery

- iBook G4 with 12.1-inch display: 50-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge (2)
- iBook G4 with 14.1-inch display: 61-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge (2)
- Integrated charge indicator LEDs on battery

Keyboard and trackpad

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement) and embedded numeric keypad
- Solid-state trackpad for precise cursor control; supports tap, double-tap and drag capabilities

Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60 Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

Size and weight: iBook G4 with 12.1-inch display

- Height: 1.35 inches (3.42 cm)
- Width: 11.2 inches (28.5 cm)
- Depth: 9.06 inches (23.0 cm)
- Weight: 4.9 pounds (2.2 kg) (1)

Size and weight: iBook G4 with 14.1-inch display

- Height: 1.35 inches (3.42 cm)
- Width: 12.7 inches (32.3 cm)
- Depth: 10.2 inches (25.9 cm)
- Weight: 5.9 pounds (2.7 kg) (1)

1. Weight varies by configuration and manufacturing process.

2. Battery life depends on configuration and use.

3. Wireless Internet access requires AirPort Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.

4. CD burning requires CD-RW drive. iTunes is for legal or rightholder-authorized copying only. Don't steal music.

5. 1GB = 1 billion bytes; actual formatted capacity less.

6. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.

7. Actual rates will vary.

8. Connection to TV requires Apple Video Adapter, sold separately.

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

# MacBook Air - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

Height:

**0.16-0.76** inch (0.4-1.94 cm)

Width:

**12.8** inches (32.5 cm)

Depth:

**8.94** inches (22.7 cm)

Weight:

**3.0** pounds (1.36 kg)<sup>1</sup>

## Processor and memory

Intel Core 2 Duo processor with 4MB on-chip shared L2 cache running at full processor speed:

- Standard 1.6 GHz
- Optional 1.8 GHz
- 800MHz frontside bus
- 2GB of 667MHz DDR2 SDRAM onboard

## Storage

- 80GB 4200-rpm Parallel ATA hard disk drive<sup>2</sup>
- Optional 64GB solid-state drive<sup>2</sup>
- Optional external USB MacBook Air SuperDrive

## Environmental status report

MacBook Air embodies Apple's continuing environmental progress. It consumes the least amount of power of any Mac and is also designed with the following features to reduce environmental impact:

- Highly recyclable aluminum enclosure
- Mercury-free LCD display with arsenic-free glass
- PVC-free internal cables
- Largely recyclable, low-volume packaging
- Meets ENERGY STAR requirements
- MacBook Air received a Silver rating from EPEAT

## Display

- 13.3-inch (diagonal) glossy widescreen TFT LED backlit display with support for millions of colors

**Supported resolutions:** 1280 by 800 (native), 1152 by 720, 1024 by 768, 800 by 600, 800 by 500, 720 by 480, and 640 by 480 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio; 720 by 480 pixels at 3:2 aspect ratio

## Graphics and video support

Pure digital video output:

- **DVI output** using micro-DVI to DVI adapter (included)
  - **VGA output** using micro-DVI to VGA adapter (included)
  - **Composite output** using micro-DVI to video adapter (optional)
  - **S-video output** using micro-DVI to video adapter (optional)
- 
- Intel GMA X3100 graphics processor with 144MB of DDR2 SDRAM shared with main memory
  - Extended desktop and video mirroring: Simultaneously supports full native resolution on the built-in display and up to 1920 by 1200 pixels on an external display, both at millions of colors
  - Built-in iSight camera

## Input

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement)
- Backlit keyboard with ambient light sensor for automatic adjustment of keyboard illumination and screen brightness
- Solid-state trackpad with multi-touch gesture support for precise cursor control; supports two-finger scrolling, pinch, rotate, swipe, tap, double-tap, and drag capabilities

## Wireless

- Built-in AirPort Extreme Wi-Fi wireless networking (based on IEEE 802.11n draft specification); IEEE 802.11a/b/g compatible
- Built-in Bluetooth 2.1 + EDR (Enhanced Data Rate)



# 8\_MacBook Air - Technical Specifications.pdf

## Peripheral connections

- Audio out
- USB 2.0 port (up to 480 Mbps)
- Micro-DVI

## Audio

- Analog audio output/headphone out (minijack)
- Built-in mono speaker
- Built-in omnidirectional microphone

## Battery and power<sup>3</sup>

- Integrated 37-watt-hour lithium-polymer battery
- 45W MagSafe power adapter with cable management system
- MagSafe power adapter port

## Electrical and operating requirements

- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95°F (10° to 35°C)
- Storage temperature: -13° to 113°F (-24° to 45°C)
- Relative humidity: 0% to 90% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

## Installed software

- Mac OS X v10.5 Leopard (includes Time Machine, Quick Look, Spaces, Spotlight, Dashboard, Mail, iChat, Safari, Address Book, QuickTime, iCal, DVD Player, Photo Booth, Front Row, Xcode Developer Tools)
- iLife '08 (includes iTunes, iPhoto, iMovie, iDVD, iWeb, GarageBand)

## What's in the box

- MacBook Air
- Micro-DVI to DVI adapter
- Micro-DVI to VGA adapter
- Cleaning/polishing cloth
- MagSafe power adapter
- Install/restore DVDs
- Printed documentation

## Accessories

### MacBook Air SuperDrive (MB397G/A)

Play or burn discs directly with the external USB-based MacBook Air SuperDrive. Thin, light, and easy to take with you, this drive is designed specifically for MacBook Air.

- Slot-loading 8x SuperDrive (DVD±R DL/DVD±RW/CD-RW)
- Size: 139 x 139 x 17 mm / 5.47 x 5.47 x 0.67 inches (L x W x H)
- Weight: 320 g (0.71 pounds)
- Requires MacBook Air with available USB 2.0 port

### USB Ethernet Adapter (MB442Z/A)

No Wi-Fi? Connect to wired networks with this simple, one-piece external adapter.

### MagSafe Airline Adapter (MB441Z/A)

Plug into your airline seat power port and keep MacBook Air powered up for the entire flight.

### Micro-DVI to Video Adapter (MB202G/A)

Get composite and S-video output from the MacBook Air micro-DVI port.

- Time Capsule (MB276LL/A)
- AirPort Extreme Base Station (MA073LL/A)
- AirPort Express Base Station featuring iTunes (M9470LL/A)
- Apple Wireless Keyboard (M9270LL/A)
- Apple Wireless Mighty Mouse (MB111LL/A)
- Apple USB Modem (MA034Z/A)
- .Mac Subscription (MA361Z/A)
- AppleCare Protection Plan (MA516LL/A)

1. Actual weight varies by configuration and manufacturing process.

2. 1GB=1 billion bytes. Actual formatted capacity less.

3. Battery life depends on configuration and use. See [www.apple.com/batteries](http://www.apple.com/batteries) for more information.

# PowerBook G4 (12-inch DVI) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (12-inch DVI) - Technical Specifications

Configurations		
Order number	M9007LL/A	M9008LL/A
Processor	1GHz PowerPC G4	1GHz PowerPC G4
Level 2 cache	512K	512K
Memory	256MB of PC2100 (266MHz) DDR SDRAM	256MB of PC2100 (266MHz) DDR SDRAM
Hard drive	40GB Ultra ATA/1005	40GB Ultra ATA/1005
Optical drive	Slot-loading Combo (DVD-ROM/CD-RW)	Slot-loading Combo (DVD-ROM/CD-RW)
Display	12.1-inch (diagonal) TFT XGA	12.1-inch (diagonal) TFT XGA
Graphics support	NVIDIA GeForce FX Go5200 with 32MB of DDR SDRAM	NVIDIA GeForce FX Go5200 with 32MB of DDR SDRAM
Wireless support	Built-in Bluetooth; 54-Mbps AirPort Extreme ready <sup>3</sup>	Built-in Bluetooth; 54-Mbps AirPort Extreme ready <sup>3</sup>
Ethernet	10/100BASE-T	10/100BASE-T
Modem	56K V.92 <sup>6</sup>	56K V.92 <sup>6</sup>
Software	Mac OS X, Mail, iChat, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie, and iDVD <sup>9</sup> ), iSync, iCal, DVD Player, Classic environment, Acrobat Reader, Art Directors Toolkit, EarthLink TotalAccess 2003 (includes 30 days of free service), FAXstf, FileMaker Pro 6 Trial, GraphicConverter, Microsoft Office v. X Test Drive, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Developer Tools, Apple Hardware Test	
Service and support	90 days of free telephone support and one-year limited warranty	
Also included	Mini-DVI to DVI adapter, mini-DVI to VGA adapter, modem cable, power adapter, AC wall plug, power cord	

Options
Options include additional RAM, larger hard disk drive, AirPort Extreme Card, additional batteries and power adapters, Apple flat-panel displays, external keyboards and mice, and third-party peripherals.

Technical Specifications
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Processor and memory

- 1GHz PowerPC G4 processor with Velocity Engine
- 512K SRAM on-chip L2 cache
- 133MHz system bus
- 256MB of PC2100 (266MHz) DDR SDRAM; one open SO-DIMM slot; support for up to 1.25GB

Storage

- 40GB 4200-rpm Ultra ATA/100 hard drive<sup>5</sup>
- One of the following optical drives:
  - Slot-loading Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 24x speed
  - Slot-loading SuperDrive (DVD-R/CD-RW): writes DVD-R discs at up to 2x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 4x speed, reads CDs at up to 24x speed

Communications

- Built-in antennas and expansion slot for optional 54-Mbps AirPort Extreme wireless networking card<sup>3</sup> (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability)
- Built-in Bluetooth
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in 56K V.92 modem<sup>6</sup> (RJ-11 connector)

Expansion

- One FireWire 400 port at up to 400 Mbps<sup>7</sup>
- Two USB 2.0 ports at up to 480 Mbps

Display

- 12.1-inch (diagonal) TFT XGA active-matrix display
  - Support for millions of colors at 1024-by-768-pixel resolution
  - Support for resolution scaling to 800-by-600-pixel and 640-by-480-pixel resolution with millions of colors

Video and graphics support

- NVIDIA GeForce FX Go5200 graphics processor with AGP 4X support and 32MB of DDR SDRAM for 2D/3D graphics acceleration
- Dual display and video mirroring: Simultaneously supports up to 1024 by 768 pixels on the built-in display and up to 2048 by 1536 pixels on an external display, both at millions of colors<sup>8</sup>
- DVI output using included mini-DVI to DVI adapter
- VGA output using included mini-DVI to VGA adapter
- S-video and composite video output using mini-DVI to video adapter (sold separately)

Audio

- Audio line in (minijack)
- Headphone out (minijack)
- Built-in stereo speakers with midrange-enhancing third speaker
- Internal omnidirectional microphone

Battery and power

- 47-watt-hour lithium-ion battery with integrated charge indicator LEDs
- Up to 5 hours of battery life<sup>4</sup>
- 45W power adapter with cable management system
- Power adapter port

Security

- Kensington cable lock slot

Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement), and embedded numeric keypad
- Solid-state trackpad for precise cursor control; supports tap, double-tap, and drag capabilities

Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 140° F (–25° to 60° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

Size and weight

- Height: 1.18 inches (3.0 cm)
- Width: 10.9 inches (27.7 cm)
- Depth: 8.6 inches (21.9 cm)
- Weight: 4.6 pounds (2.1 kg) with battery and optical drive installed<sup>1</sup>

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included.

1. Actual weight varies by configuration and manufacturing process.

2. Available in selected models.

3. Wireless Internet access requires AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.

4. Battery life depends on configuration and use.

5. 1GB = 1 billion bytes; actual formatted capacity less.

6. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.

7. Actual rates will vary.

8. Some third-party DVI displays may not support all resolutions.

9. iDVD requires Apple SuperDrive.

# PowerBook G4 (15-inch FW800) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (15-inch FW800) - Technical Specifications

Configurations					
Order number	12-inch Combo drive M9007LL/A	12-inch SuperDrive M9008LL/A	15-inch Combo drive M8980LL/A	15-inch SuperDrive M8981LL/A	17-inch SuperDrive M9110LL/A
Processor	1GHz PowerPC G4			1.25GHz PowerPC G4	1.33GHz PowerPC G4
Cache	512K SRAM level 2 cache				
Memory	256MB PC2100 (266MHz) DDR SDRAM		256MB PC2700 (333MHz) DDR SDRAM	512MB PC2700 (333MHz) DDR SDRAM	
Display	12.1-inch (diagonal), 1024x768 resolution, TFT		15.2-inch (diagonal), 1280x854 resolution, TFT widescreen		17-inch (diagonal), 1440x900 resolution, TFT widescreen
Graphics	NVIDIA GeForce FX Go5200 with 32MB of DDR SDRAM		ATI Mobility Radeon 9600 with 64MB of DDR SDRAM		
Hard disk drive (1)	40GB Ultra ATA/100		60GB Ultra ATA/100	80GB Ultra ATA/100	
Slot-loading optical drive	Combo drive (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)	Combo drive (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)	
Ethernet	Built-in 10/100BASE-T		Built-in 10/100/1000BASE-T (Gigabit)		
Wireless (2)	Built-in Bluetooth; 54-Mbps AirPort Extreme ready			Built-in Bluetooth; built-in 54-Mbps AirPort Extreme	
Modem (3)	Built-in 56K V.92 modem				
Keyboard	Full size			Full size, illuminated with ambient light sensor	
System software	Mac OS X version 10.3 "Panther"				
Software	Mail, iChat AV, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie, and iDVD(4)), iSync, iCal, DVD Player, Classic environment, Art Directors Toolkit, EarthLink TotalAccess 2003 (includes 30 days of free service), FileMaker Pro 6 Trial, GraphicConverter, Microsoft Office v. X Test Drive, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Zinio Reader, Developer Tools, and Apple Hardware Test				
Video accessories	Mini-DVI to DVI adapter, mini-DVI to VGA adapter		S-video to composite adapter, DVI to VGA adapter		
Hardware accessories	Modem cable, power adapter, AC wall plug, power cord				
Limited warranty and service	Your PowerBook G4 comes with 90 days of telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> and get three years of service and support. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.				
Internet access	30 days of free dial-up Internet service with EarthLink (North America only) activation. Internet access requires a compatible Internet service provider; fees may apply.				

Build-to-Order Options	
Order a custom-configured computer from the online <a href="#">Apple Store</a> or an Apple Authorized reseller.	
Memory	256MB, 512MB, 1GB SO-DIMMs
Hard drive	80GB 4200-rpm drive 80GB 5400-rpm drive (15-inch and 17-inch models)
Wireless	AirPort Extreme Card M8881LL/A AirPort Extreme Base Station M8930LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A
Displays	Apple Studio Display (17-inch flat panel) M7649ZM/B Apple Cinema Display (20-inch flat panel) M8893ZM/A Apple Cinema HD Display (23-inch flat panel) M8537ZM/A Apple DVI to ADC Adapter M8661LL/B Apple Mini-DVI to DVI Adapter M9321G/A (12-inch model) Apple Mini-DVI to VGA Adapter M9320G/A (12-inch model) Apple Mini-DVI to Video Adapter M9319G/A (12-inch model)

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<b>Battery and power</b>	Apple Portable Power Adapter M8943LL/A PowerBook G4 12-inch Rechargeable Battery M9324G/A PowerBook G4 15-inch Rechargeable Battery M9325G/A PowerBook G4 17-inch Rechargeable Battery M9326G/A<
<b>Built-in keyboard</b>	Illuminated keyboard with ambient light sensor (1GHz 15-inch model only)
<b>External keyboard and mouse</b>	Apple Wireless Keyboard M9270LL/A Apple Wireless Mouse M9269ZM/A Apple Keyboard (White) M9034LL/A Apple Mouse (White) M9035G/A
<b>Services</b>	AppleCare Protection Plan M8853LL/A .Mac Subscription M9036Z/A

## Technical Specifications

### Processor and Memory

- 1GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 133MHz system bus (12-inch models)
- 256MB of PC2100 (266MHz) DDR SDRAM; one open SO-DIMM slot; support for up to 1.25GB (12-inch models)
- 1GHz or 1.25GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus (15-inch models)
- 256MB or 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB (15-inch models)
- 1.33GHz PowerPC G4 processor with Velocity Engine, 512K SRAM on-chip L2 cache, 167MHz system bus (17-inch model)
- 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB (17-inch model)

### Storage <sup>(1)</sup>

- 40GB 4200-rpm Ultra ATA/100 hard drive (12-inch models)
- 60GB or 80GB 4200-rpm Ultra ATA/100 hard drive
- 80GB 5400-rpm Ultra ATA/100 hard drive (15-inch and 17-inch models)
- One of the following slot-loading optical drives
  - Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 24x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 24x speed
  - SuperDrive (DVD-R/CD-RW): writes DVD-R discs at up to 2x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 4x speed, reads CDs at up to 24x speed

### Communications

- Expansion slot for optional 54-Mbps AirPort Extreme wireless networking card (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) (12-inch models and 1GHz 15-inch model) (2)
- Built-in 54-Mbps AirPort Extreme wireless networking (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability) (1.25GHz 15-inch model and 17-inch model) (2)
- Built-in Bluetooth 1.1
- Built-in 10/100BASE-T Ethernet (RJ-45 connector) (12-inch models)
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector) (15-inch and 17-inch models)

### Display

- 12.1-inch (diagonal) TFT display (12-inch models)
  - Support for millions of colors at 1024-by-768-pixel resolution
  - Support for resolution scaling to 800-by-600-pixel and 640-by-480-pixel resolution with millions of colors
- 15.2-inch (diagonal) TFT display (15-inch models)
  - Support for millions of colors at 1280-by-854-pixel resolution
  - Support for resolutions of 1280 by 854 (native), 1152 by 640, 1896 by 600, 720 by 480, and 640 by 480 pixels at 3:2 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio
- 17-inch (diagonal) TFT display (17-inch model)
  - Support for millions of colors at 1440-by-900-pixel resolution
  - Supported resolutions: 1440 by 900 (native), 1152 by 720, 1024 by 768, 1024 by 640 and 800 by 600 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio

### Video and graphics support

- NVIDIA GeForce FX Go5200 graphics processor with AGP 4X support and 32MB of DDR SDRAM video memory (12-inch models)
  - Dual display and video mirroring: Simultaneously supports up to 1024 by 768 pixels on the built-in display and up to 2048 by 1536 pixels on an external display, both at millions of colors (7)
- ATI Mobility Radeon 9600 graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory (15-inch models)
  - Dual display and video mirroring: Simultaneously supports up to 1024 by 854 pixels on the built-in display and up to 2048 by 1536 pixels on an external display, both at millions of colors (7)
- ATI Mobility Radeon 9600 graphics processor with AGP 4X support and 64MB of DDR SDRAM video memory (17-inch model)
  - Dual display and video mirroring: Simultaneously supports up to 1440 by 900 pixels on the built-in display and up to 2048 by 1536 pixels on an external display, both at millions of colors (7)

### Audio

- Audio line in (minijack)
- Headphone out (minijack)
- Built-in stereo speakers with midrange-enhancing third speaker (12-inch and 15-inch models)
- Two built-in stereo speakers (17-inch model)
- Internal omnidirectional microphone

### Battery and power

- 47-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 5 hours of battery life (12-inch models) (8)
- 46-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life (15-inch models) (8)
- 58-watt-hour lithium-ion battery (with integrated charge indicator LEDs) providing up to 4.5 hours of battery life (17-inch model) (8)
- 45W power adapter with cable management system (12-inch models)
- 65W power adapter with cable management system (15-inch and 17-inch models)
- Power adapter port

### Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted "T" arrangement), and embedded keypad
- Illuminated fiber-optic, backlit keyboard with ambient light sensor (1.25GHz 15-inch model and 17-inch model, optional on 1GHz 15-inch model)
- Solid-state trackpad provides precise cursor control; supports tap, double-tap, and drag capabilities

### Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50 to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 140° F (-25° to 60° C) (12-inch model)
- Storage temperature: -40° to 116° F (-40° to 47° C) (15-inch and 17-inch models)
- Relative humidity: 20% to 80% noncondensing (12-inch and 17-inch models)
- Relative humidity: 0% to 90% noncondensing (15-inch models)
- Maximum operating altitude: 10,000 ft
- Maximum storage altitude: 15,000 ft
- Maximum shipping altitude: 35,000

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- Built-in 56K V.92 modem (RJ-11 connector) (3)

**Expansion**

- One FireWire 400 (IEEE 1394a) port at up to 400 Mbps (5)
- One FireWire 800 (IEEE 1394b) port at up to 800 Mbps (15-inch and 17-inch models) (5)
- Two USB 2.0 ports at up to 480 Mbps
- One PC Card/CardBus slot supporting one Type I or Type II card (15-inch and 17-inch models)

**Security**

- Kensington cable lock slot

- ADC output using optional Apple DVI to ADC Adapter (6)
- Mini-DVI port (12-inch models)
- DVI output using included mini-DVI to DVI adapter (12-inch models)
- VGA output using included mini-DVI to VGA adapter (12-inch models)
- S-video and composite video output using mini-DVI to video adapter (sold separately) (12-inch models)
- DVI output port (15-inch and 17-inch models)
- VGA output using included DVI to VGA adapter (15-inch and 17-inch models)
- S-video output port (15-inch and 17-inch models)
- Composite video output using included S-video to composite adapter (15-inch and 17-inch models)

ft

**Size and weight** (12-inch model)

- Height: 1.18 inches (3.0 cm)
- Width: 10.9 inches (27.7 cm)
- Depth: 8.6 inches (21.9 cm)
- Weight: 4.6 pounds (2.1 kg) with battery and optical drive installed (9)

**Size and weight** (15-inch models)

- Height: 1.1 inches (2.8 cm)
- Width: 13.7 inches (34.8 cm)
- Depth: 9.5 inches (24.1 cm)
- Weight: 5.6 pounds (2.5 kg) with battery and optical drive installed (9)

**Size and weight** (17-inch model)

- Height: 1.0 inch (2.6 cm)
- Width: 15.4 inches (39.2 cm)
- Depth: 10.2 inches (25.9 cm)
- Weight: 6.9 pounds (3.1 kg) with battery and optical drive installed (9)

1. 1GB = 1 billion bytes; actual formatted capacity less.
2. Wireless Internet access requires AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.
3. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.
4. iDVD requires Apple SuperDrive.
5. Actual rates will vary.
6. Connection to Apple flat-panel displays requires Apple DVI to ADC Adapter (sold separately).
7. Some third-party DVI displays may not support all resolutions. Actual resolutions and refresh rates depend on the monitor.
8. Battery life depends on configuration and use.
9. Actual weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply. Product includes electronic documentation. Backup copy of software is included. Product specifications are subject to change without notice.

Published Date: Apr 6, 2016

# PowerBook G4 (17-inch 1.33GHz) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## PowerBook G4 (17-inch 1.33GHz) - Technical Specifications

Configurations	
Order number	M9110LL/A
Processor	1.33GHz PowerPC G4
Level 2 cache	512K
Memory	512MB of PC2700 (333MHz) DDR SDRAM
Hard drive	80GB Ultra ATA/100 <sup>2</sup>
Optical drive	Slot-loading SuperDrive (DVD-R/CD-RW)
Display	17-inch (diagonal) TFT widescreen
Graphics support	ATI Mobility Radeon 9600 with 64MB of DDR SDRAM
Wireless support	Built-in 54-Mbps AirPort Extreme <sup>1</sup> ; built-in Bluetooth
Ethernet	10/100/1000BASE-T (Gigabit)
Modem	56K V.92 <sup>3</sup>
Keyboard	Full size; backlit with ambient light sensor
Software	Mac OS X, Mail, iChat, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie, and iDVD), iSync, iCal, DVD Player, Classic environment, Acrobat Reader, Art Directors Toolkit, EarthLink TotalAccess 2003 (includes 30 days of free service), FAXstf, FileMaker Pro 6 Trial, GraphicConverter, Microsoft Office v. X Test Drive, OmniGraffle, OmniOutliner, QuickBooks for Mac New User Edition, Developer Tools, Apple Hardware Test
Service and support	90 days of free telephone support and one-year limited warranty
Also included	S-video to composite adapter, DVI to VGA adapter, modem cable, power adapter, AC wall plug, power cord

Options
Options include additional RAM, hard drive, additional batteries and power adapters, Apple flat-panel displays, external keyboards and mice, and third-party peripherals.

## Technical Specifications

Processor and memory

- 1.33GHz PowerPC G4 processor with Velocity Engine
- 512K SRAM on-chip L2 cache
- 167MHz system bus
- 512MB of PC2700 (333MHz) DDR SDRAM; two SO-DIMM slots support up to 2GB

Storage

- 80GB 4200-rpm Ultra ATA/100 hard drive<sup>2</sup>
- Slot-loading SuperDrive (DVD-R/CD-RW)
  - Writes DVD-R discs at up to 2x speed; reads DVDs at up to 8x speed
  - Writes CD-R discs at up to 16x speed; writes CD-RW discs at up to 4x speed
  - Reads CDs at up to 24x speed

Communications

- Built-in 54-Mbps AirPort Extreme wireless networking<sup>1</sup> (based on 802.11g standard; Wi-Fi Certified for 802.11g and 802.11b interoperability)
- Built-in Bluetooth
- Built-in 10/100/1000BASE-T Gigabit Ethernet (RJ-45 connector)
- Built-in 56K V.92 modem<sup>3</sup> (RJ-11 connector)

Expansion

- One FireWire 800 port at up to 800 Mbps; one FireWire 400 port at up to 400 Mbps<sup>4</sup>
- Two USB 2.0 ports at up to 480 Mbps
- PC Card/CardBus slot for Type I or Type II card

Display

- 17-inch (diagonal) TFT widescreen display
  - Support for millions of colors at 1440-by-900- pixel resolution
  - Supported resolutions: 1440 by 900 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio

Video and graphics support

- ATI Mobility Radeon 9600 graphics processor with AGP 4X support and 64MB of DDR SDRAM for 2D/3D graphics acceleration
- Dual display and video mirroring: Simultaneously supports up to 1440 by 900 pixels on the built-in display and up to 2048 by 1536 pixels on an external display, both at millions of colors<sup>5</sup>
- DVI output port
- VGA output using included DVI to VGA adapter
- S-video output port
- Composite video output using included S-video to composite adapter

Audio

- Audio line in (minijack)
- Headphone out (minijack)
- Two built-in stereo speakers
- Internal omnidirectional microphone (located under left speaker grille)

Battery and power

- 58-watt-hour lithium-ion prismatic battery with integrated charge indicator LEDs
- Up to 4.5 hours of battery life<sup>6</sup>
- 65W power adapter with cable management system
- Power adapter port

Security

- Kensington cable lock slot

Keyboard and trackpad

- Built-in full-size keyboard with 78 (U.S.) or 79 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement), and embedded numeric keypad
  - Illuminated fiber-optic, backlit keys
- Solid-state trackpad for precise cursor control; supports tap, double-tap, and drag capabilities

Ambient light sensor

- Measures ambient light and works with integrated software to adjust keyboard illumination and screen brightness based on user preferences

Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100V to 240V AC
- Frequency: 50Hz to 60Hz
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –40° to 116° F (–40° to 47° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet
- Maximum shipping altitude: 35,000 feet

Size and weight

- Height: 1.0 inch (2.6 cm)
- Width: 15.4 inches (39.2 cm)
- Depth: 10.2 inches (25.9 cm)
- Weight: 6.9 pounds (3.1 kg) with battery and optical drive installed<sup>7</sup>

Internet access requires a compatible Internet service provider; fees may apply. Product contains electronic documentation. Backup copy of software is included. 1Wireless

1. Wireless Internet access requires AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station, and Internet access (fees may apply). Achieving data rates up to 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.

2. 1GB = 1 billion bytes; actual formatted capacity less.

3. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.

4. Actual rates will vary.

5. Some third-party DVI displays may not support all resolutions.

6. Battery life depends on configuration and use.

7. Actual weight varies by configuration and manufacturing process.



# iMac (Flat Panel), iMac (17-inch Flat Panel) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iMac (Flat Panel), iMac (17-inch Flat Panel) - Technical Specifications

Available Configurations				
Order no.	M8672LL/B	M7677LL/B	M8535LL/B	M8812LL/A
Display	15-inch LCD	15-inch LCD	15-inch LCD	17-inch widescreen LCD
Processor	700MHz PowerPC G4	700MHz PowerPC G4	800MHz PowerPC G4	800MHz PowerPC G4
Memory	128MB	256MB	256MB	256MB
Hard drive <sup>(1)</sup>	40GB Ultra ATA	40GB Ultra ATA	60GB Ultra ATA	80GB Ultra ATA
Optical drive	CD-RW	Combo (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)	SuperDrive (DVD-R/CD-RW)
Graphics support	NVIDIA GeForce2 MX with 32 MB of DDR SDRAM			NVIDIA GeForce4 MX with 32 MB of DDR SDRAM
FireWire	Two 400-Mbps FireWire (IEEE 1394) ports; 8 watts shared			
USB	Five USB 1.1 ports; three on computer (shared on two 12-Mbps controllers); two on keyboard			
VGA video mirroring	Mini-VGA output port (requires VGA display adapter). Support for video mirroring: external devices display an image identical to that shown on the built-in display			
Modem <sup>(2)</sup>	Built-in 56K modem (RJ-11 connector)			
Ethernet	Built-in 10/100BASE-T Ethernet (RJ-45 connector)			
Wireless networking <sup>(3)</sup>	Airport ready. Built-in antennas and card slot for optional 11-Mbps AirPort Card; IEEE 802.11b DSSS compliant			
System software	Mac OS X, Mac OS 9			
Software	QuickTime, iChat, iMovie, iPhoto, iTunes, iDVD (SuperDrive-equipped system only), DVD Player, AppleWorks, Mac OS X Mail, Microsoft Internet Explorer, EarthLink (includes 30 days of free service), AOL, Quicken 2002 Deluxe, World Book Mac OS X Edition, Mac OS X Chess, Otto Matic, Deimos Rising, FaxSTF, and Acrobat Reader			
Services and warranty	90 days of free telephone support and one-year limited warranty.			
Hardware accessories	SuperDrive and Combo drive models include Apple Pro Speakers. All models include Apple Pro Keyboard; Apple Pro Mouse; modem cable; Apple Hardware Test CD; complete setup, learning, and reference documentation. Product contains electronic documentation. Backup copy of software is provided on CD-ROM.			
Internet access	Internet service through <a href="#">EarthLink</a> . Internet access requires an Internet service account; fees may apply.			
Build-to-Order options	In addition to choosing from Apple's preconfigured systems, you can order an iMac with factory-installed options such as more RAM, AirPort wireless networking, and Apple Pro Speakers (for the CD-RW-equipped iMac) from the <a href="#">Apple Store</a> or an authorized Apple reseller.			

# 93\_iMac (Flat Panel), iMac (17-inch Flat Panel) - Technical Specifications.pdf

## Technical Specifications

### Processor and memory

- 700MHz or 800MHz PowerPC G4 processor with Velocity Engine
- 256K on-chip level 2 cache at full processor speed
- 100MHz system bus
- 128MB or 256MB of SDRAM expandable to 1GB; one 168-pin DIMM and one open user-accessible SO-DIMM slot

### Storage

- 40GB, 60GB or 80GB Ultra ATA hard disk drive<sup>(1)</sup>
- One of the following optical drives:
  - CD-RW drive; writes CD-R discs at 24x speed, writes CD-RW discs at 10x speed, reads CDs at 32x speed
  - Combo drive (DVD-ROM/CD-RW); reads DVDs at 8x speed, writes CD-R discs at 12x speed, writes CD-RW discs at 8x speed, reads CDs at 32x speed
  - SuperDrive (DVD-R/CD-RW); writes DVD-R discs at 2x speed, reads DVDs at 6x speed, writes CD-R discs at 8x speed, writes CD-RW discs at 4x speed, reads CDs at 24x speed

### Display

- Built-in 17-inch (viewable) widescreen or 15-inch (viewable) TFT active-matrix liquid crystal display
- Millions of colors at 1440-by-900-pixel resolution on 17-inch display and 1024-by-768-pixel resolution on 15-inch display
- Typical viewing angle: 120° horizontal; 90° vertical
- Typical brightness: 200 candela per meter squared
- Typical contrast ratio: 300:1

### Graphics support

- NVIDIA GeForce4 MX or GeForce2 MX graphics processor with AGP 2X support
- 32MB of dedicated Double Data Rate (DDR) video memory
- 17-inch display resolutions: 1440 by 900 (native), 1152 by 720, 1024 by 640, and 800 by 500 pixels at 16:10 aspect ratio; 1024 by 768, 800 by 600, and 640 by 480 pixels at 4:3 aspect ratio
- 15-inch display resolutions: 1024 by 768 (native), 800 by 600, and 640 by 480 pixels

### Communications

- Built-in 56K V.90 modem (RJ-11 connector)<sup>(2)</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and card slot for optional 11-Mbps AirPort Card; IEEE 802.11b compliant<sup>(3)</sup>

### Audio

- Built-in speaker
- Apple Pro Speakers (9 watts each)<sup>(5)</sup>
- Internal 18-watt digital amplifier
- Apple speaker minijack for connection to Apple Pro Speakers
- Headphone jack
- Built-in microphone

### Video

- Mini-VGA output port (requires VGA display adapter)
- Support for video mirroring: external devices display an image identical to that shown on the built-in display
- Output resolutions: 640 by 480 pixels at 60Hz, 800 by 600 pixels at 75Hz, and 1024 by 768 pixels at 75Hz

### Peripheral connections

- Two 400-Mbps FireWire (IEEE 1394) ports<sup>(4)</sup>; 8 watts shared
- Total of five USB 1.1 ports; three on computer (shared on two 12-Mbps controllers); two on keyboard

### Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 90V to 264V AC
- Frequency: 47Hz to 63Hz, single phase
- Maximum continuous power: 130W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet

### Size and weight (iMac with 17-inch display)

- Height: 13.03 inches (33.1 cm) minimum; 20.0 inches (50.9 cm) maximum
- Width: 16.7 inches (42.3 cm) minimum; 17.7 inches (44.9 cm) maximum
- Depth: 10.6 inches (27.0 cm) minimum; 16.7 inches (42.3 cm) maximum
- Diameter of base: 10.6 inches (27.0 cm)
- Weight: 22.8 pounds (10.4 kg)<sup>(6)</sup>

### Size and weight (iMac with 15-inch display)

- Height: 12.95 inches (32.9 cm) minimum; 20.0 inches (50.9 cm) maximum
- Width: 15.1 inches (38.4 cm) minimum; 16.3 inches (41.5 cm) maximum
- Depth: 10.6 inches (27.0 cm) minimum; 16.3 inches (41.5 cm) maximum
- Diameter of base: 10.6 inches (27.0 cm)
- Weight: 21.2 pounds (9.7 kg)<sup>(6)</sup>

Some features require Mac OS X v10.2 which may not be included with all systems. Internet access requires a compatible ISP; fees may apply.

(1) 1GB = 1 billion bytes; actual formatted capacity less.  
(2) Actual modem speeds lower; speed depends on connection rate and other factors.  
(3) Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.  
(4) Actual rates will vary.  
(5) Available on Selected models.  
(6) Weight varies by configuration and manufacturing process.

# iMac (USB 2.0) - Technical Specifications

## iMac (USB 2.0) - Technical Specifications

Configurations			
Order number	15-inch 1GHz Combo Drive M9285LL/A	17-inch 1.25GHz SuperDrive M9168LL/A	20-inch 1.25GHz SuperDrive M9290LL/A
Display	15-inch (viewable) TFT active-matrix LCD, 1024 by 768 pixels, millions of colors	17-inch (viewable) widescreen TFT active-matrix LCD, 1440 by 900 pixels, millions of colors	20-inch (viewable) widescreen TFT active-matrix LCD, 1680 by 1050 pixels, millions of colors
Processor	1GHz PowerPC G4	1.25GHz PowerPC G4	1.25GHz PowerPC G4
System bus	167MHz		
Memory	256MB of PC2700 (333MHz) DDR SDRAM; supports up to 1GB		
Hard drive (1)	80GB Ultra ATA/100; 7200 rpm		
Optical drive	32x Combo (DVD-ROM/CD-RW) drive	4x SuperDrive (DVD-R/CD-RW)	
Graphics support	NVIDIA GeForce4 MX with 32MB of DDR SDRAM	NVIDIA GeForce FX 5200 Ultra with 64MB of DDR SDRAM	
Ports	Two FireWire 400 ports, three USB 2.0 ports on computer, two USB 1.1 ports on keyboard, VGA output port (2), S-video and composite video output (2), headphone jack, Apple speaker minijack, audio line-in jack		
VGA video mirroring	Yes. Requires Apple VGA Display Adapter, sold separately.		
S-video and composite video output	Yes. Requires Apple Video Adapter, sold separately.		
Networking	Built-in 10/100BASE-T Ethernet and 56K V.92 modem (3)		
Wireless	AirPort Extreme ready(4); internal Bluetooth module available as a build-to-order option		
System software	Mac OS X version 10.3 "Panther"		
Software	Mail, iChat, Safari, Sherlock, Address Book, QuickTime, iLife (includes iTunes, iPhoto, iMovie and iDVD), iSync, iCal, DVD Player, AppleWorks, Mac OS X Chess and Classic environment; Microsoft Internet Explorer, EarthLink (includes 30 days of free service), Quicken 2003 Deluxe, World Book 2003 Edition, Microsoft Office v.X Test Drive, Tony Hawk's Pro Skater 4, Deimos Rising and Sound Studio; Apple Hardware Test		
Hardware accessories	Apple Keyboard, Apple Mouse, Apple Pro Speakers, modem cable		
Limited Warranty and Service	Your iMac comes with 90 days of telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> and get three years of service and support. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.		
Internet access	All models include 30 days of free dial-up Internet service with EarthLink (North America only) activation. Internet access requires a compatible Internet service provider; fees may apply.		

Build-to-Order Options	
Order a custom-configured computer from the online Apple Store or an authorized Apple reseller.	
Memory	256MB, 512MB, 1GB
Hard Drive	160GB 7200-rpm drive
Wireless	AirPort Extreme Card M8881LL/A AirPort Extreme Base Station M8930LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A D-Link USB Bluetooth Adapter T6295ZM/A
Adapters and Cables	Apple Video Adapter M9109G/A Apple VGA Display Adapter M8639G/A Apple FireWire Cable (4-pin to 6-pin) M8706G/A
Services	AppleCare Protection Plan M8851LL/A .Mac Subscription: Retail Box MA175Z/A or Family Pack MA176Z/A Apple Customer Training

### Technical Specifications

# 94\_iMac (USB 2.0) - Technical Specifications.pdf

## Processor and memory

- 1GHz or 1.25GHz PowerPC G4 processor with Velocity Engine
- 256K on-chip level 2 cache at full processor speed
- 167MHz system bus
- 256MB of PC2700 (333MHz) DDR SDRAM expandable to 1GB; one 184-pin DIMM and one open user-accessible SO-DIMM slot

## Storage

- 80GB Ultra ATA/100 7200-rpm hard disk drive (1)
- One of the following optical drives:
  - Combo drive (DVD-ROM/CD-RW): reads DVDs at up to 8x speed, writes CD-R discs at up to 32x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 32x speed
  - SuperDrive (DVD-R/CD-RW): writes DVD-R discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 32x speed

## Display

- Built-in 20-inch (viewable) widescreen, built-in 17-inch (viewable) widescreen, or 15-inch (viewable) TFT active-matrix liquid crystal display
- Millions of colors at all resolutions
- Typical viewing angle: 120° horizontal (15-inch and 17-inch models); 170° horizontal (20-inch model); 90° vertical (15-inch and 17-inch models), 170° vertical (20-inch model)
- Typical brightness: 200 cd/m<sup>2</sup> (15-inch and 17-inch models); 230 cd/m<sup>2</sup> (20-inch model)
- Typical contrast ratio: 300:1 (15-inch and 17-inch models); 350:1 (20-inch model)

## Peripheral connections

- Two FireWire 400 ports; 8 watts shared
- Total of five USB ports: three USB 2.0 ports (up to 480 Mbps) on computer, two USB 1.1 ports on keyboard

## Graphics support

- NVIDIA GeForce FX 5200 Ultra or GeForce4 MX graphics processor with AGP 4X support
- 64MB or 32MB of dedicated Double Data Rate (DDR) video memory
- 20-inch display resolutions: 1680 x 1050 (native), 1344 x 840, 1280 x 800, 1024 x 640, 840 x 524 and 800 x 500 pixels at 16:10 aspect ratio; 1024 x 768, 800 x 600 and 640 x 480 pixels at 4:3 aspect ratio
- 17-inch display resolutions: 1440 x 900 (native), 1152 x 720, 1024 x 640 and 800 x 500 pixels at 16:10 aspect ratio; 1024 x 768, 800 x 600 and 640 x 480 pixels at 4:3 aspect ratio
- 15-inch display resolutions: 1024 x 768 (native), 800 x 600 and 640 x 480 pixels

## Communications

- Built-in 56K V.92 modem (RJ-11 connector) (3)
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and expansion slot for optional 54 Mbps AirPort Extreme Card (based on 802.11g standard; 802.11b Wi-Fi Certified) (4)
- Optional internal Bluetooth

## Audio

- Built-in speaker
- Apple Pro Speakers (7 watts each) and minijack
- Internal 14-watt digital amplifier
- Headphone jack
- Audio line in jack
- Built-in microphone

## Video

- VGA output port for video mirroring on external display or projector (2)
- S-video and composite video output to connect directly to a TV or projector (2)
- Output resolutions: 640 x 480 pixels at 60Hz, 800 x 600 pixels at 75Hz and 1024 x 768 pixels at 75Hz

## Electrical and environmental requirements

- Meets ENERGY STAR and TCO 95 requirements
- Line voltage: 90V to 264V AC
- Frequency: 47Hz to 63Hz, single phase
- Maximum continuous power: 190 W (20-inch model); 160W (17-inch model); 130W (15-inch model)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet

## Size and weight (iMac with 20-inch display)

- Height: Height: 13.93 inches (35.4 cm) minimum; 20.9 inches (53.0 cm) maximum
- Width: 17.3 inches (44.0 cm) minimum; 20.2 inches (51.4 cm) maximum
- Depth: 10.6 inches (27.0 cm) minimum; 17.3 inches (44.0 cm) maximum
- Diameter of base: 10.6 inches (27.0 cm)
- Weight: 40.1 pounds (18.2 kg)(5)

## Size and weight (iMac with 17-inch display)

- Height: 13.03 inches (33.1 cm) minimum; 20.0 inches (50.9 cm) maximum
- Width: 16.7 inches (42.3 cm) minimum; 17.7 inches (44.9 cm) maximum
- Depth: 10.6 inches (27.0 cm) minimum; 16.7 inches (42.3 cm) maximum
- Diameter of base: 10.6 inches (27.0 cm)
- Weight: 22.8 pounds (10.4 kg)(5)

## Size and weight (iMac with 15-inch display)

- Height: 12.95 inches (32.9 cm) minimum; 20.0 inches (50.9 cm) maximum
- Width: 15.1 inches (38.4 cm) minimum; 16.3 inches (41.5 cm) maximum
- Depth: 10.6 inches (27.0 cm) minimum; 16.3 inches (41.5 cm) maximum
- Diameter of base: 10.6 inches (27.0 cm)
- Weight: 21.2 pounds (9.7 kg)(5)

1. 1GB = 1 billion bytes; actual formatted capacity less.  
2. Requires adapter, sold separately.  
3. Compatible ISP and telephone services required; fees may apply. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower.  
4. Achieving data rates of 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. If a user of a Wi-Fi Certified 802.11b product joins the network, that user will get up to 11 Mbps and AirPort Extreme users will get less than 54 Mbps. Actual speed will vary based on range, connection rate, site conditions, size of network and other factors.  
5. Weight varies by configuration and manufacturing process.

Wireless Internet access requires AirPort Extreme Card, AirPort Base Station or AirPort Extreme Base Station and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort and AirPort Extreme. Range may vary with site conditions.  
Internet access requires a compatible ISP; fees may apply.  
Product contains electronic documentation. Backup copy of software is included.  
Product specifications are subject to change without notice.

# iBook (14.1 LCD) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iBook (14.1 LCD) - Technical Specifications

Configurations			
Order no.	M8597LL/C	M8599LL/C	M7701LL/A
Processor	500-MHz PowerPC G3	600-MHz PowerPC G3	600-MHz PowerPC G3
System bus	66 MHz	100 MHz	100 MHz
Memory	128MB, expandable to 640MB	128MB, expandable to 640MB	256MB, expandable to 640MB
Hard disk drive <sup>2</sup>	15GB Ultra ATA	20GB Ultra ATA	20GB Ultra ATA
Optical drive	CD-ROM	DVD-ROM/CD-RW	DVD-ROM/CD-RW
Display	12.1-inch (diagonal) TFT XGA	12.1-inch (diagonal) TFT XGA	14.1-inch (diagonal) TFT XGA
Graphics support	ATI RAGE Mobility 128 with 8MB SDRAM	ATI RAGE Mobility 128 with 8MB SDRAM	ATI RAGE Mobility 128 with 8MB SDRAM
FireWire	One port	One port	One port
USB	Two ports	Two ports	Two ports
VGA and composite video output	Yes	Yes	Yes
Modem <sup>6</sup>	56K	56K	56K
Ethernet	10/100BASE-T	10/100BASE-T	10/100BASE-T
Wireless networking <sup>7</sup>	AirPort ready	AirPort ready	AirPort ready

All models include a built-in keyboard and trackpad, VGA display adapter, modem cable, power adapter, AC wall plug, power cord, and lithium-ion battery; Mac OS X v10.1, Mac OS 9.2, QuickTime, iMovie 2, iTunes 2, AppleWorks, Mac OS X Mail, Microsoft Internet Explorer, EarthLink, AOL, World Book Mac OS X Edition, Otto Matic, PCalc, Acrobat Reader, and FAXstf 10.0 Preview; Apple Hardware Test CD; complete setup, learning, and reference documentation; limited warranty; and 30 days of free Internet service through EarthLink.

Internet access requires an Internet service account; fees may apply. Product contains electronic documentation. Backup copy of software is provided on CD-ROM.

Options	
Product	Order no.
Apple Portable Power Adapter	M8576LL/A
iBook Rechargeable Battery (12.1-inch model)	M8626G/A
iBook Rechargeable Battery (14.1-inch model)	M8665G/A
Apple AV Cable	M8434G/A
Apple VGA Display Adapter	M8639G/A
AirPort Card	M7600LL/C
AirPort Base Station	M8209LL/A
iPod	M8513LL/A
Apple FireWire Cable (6-pin to 6-pin, 0.5 meter)	M8633G/A
Apple FireWire Cable (6-pin to 6-pin, 2 meter)	M8634G/A
AppleCare Protection Plan	M8094LL/A

## Technical Specifications

Processor and memory

- 500-MHz PowerPC G3 processor with 66-MHz system bus; or 600-MHz PowerPC G3 processor with 100-MHz system bus
- 256K on-chip level 2 cache running at full processor speed
- One of the following memory configurations:
  - 128MB of SDRAM built in
  - 256MB of SDRAM (128MB built in and 128MB in SO-DIMM slot)
- Single 1.25-inch standard SO-DIMM slot (3.3V) supports up to 512MB SO-DIMM for a total of 640MB of SDRAM

Storage

- 15GB or 20GB Ultra ATA hard disk drive<sup>2</sup>
- One of the following optical drives:
  - 24x-speed (maximum) CD-ROM drive
  - 4x4x6x24x-speed (maximum) DVD-ROM/CD-RW Combo drive on 12.1-inch model (writes CD-R and CD-RW discs at 4x speed; reads DVD-ROM discs at 6x speed; reads CD-ROM discs at 24x speed)
  - 8x8x8x24x-speed (maximum) DVD-ROM/CD-RW Combo drive on 14-inch model (writes CD-R and CD-RW discs at 8x speed; reads DVD-ROM discs at 8x speed; reads CD-ROM discs at 24x speed)
  - Optional 8x-speed (maximum) DVD-ROM drive available on 500-MHz model (reads DVD-ROM discs at 8x speed; reads CD-ROM discs at 24x speed)
- Support for external FireWire and USB storage devices

Display

- Choice of built-in 12.1-inch or 14.1-inch (diagonal) TFT XGA active-matrix display
- Support for millions of colors at 1024-by-768-pixel resolution
- Support for resolution scaling to 800-by-600-pixel and 640-by-480-pixel resolution with millions of colors

Graphics support

- ATI RAGE Mobility 128 graphics accelerator with 8MB of SDRAM graphics memory and AGP 2X support

Communications

- Built-in 56K V.90 modem (RJ-11 connector)<sup>6</sup>
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and card slot for optional 11-Mbps AirPort Card; IEEE 802.11b compliant<sup>7</sup>

Peripheral connections

- Two 12-Mbps USB ports
- One 400-Mbps FireWire (IEEE 1394) port<sup>8</sup>

Audio

- 16-bit CD-quality stereo sound output minijack through AV port
- Built-in stereo speakers
- Built-in microphone
- Support for external USB audio devices such as microphones and speakers

Video

- VGA video output port for video mirroring on an external display or projector (24-bit color)
- Composite video output to TV or projector through AV port (requires Apple AV Cable)

Battery and power

- iBook with 12.1-inch display: 42-watt-hour lithium-ion battery provides up to 5 hours of battery life on a single charge<sup>3</sup>
- iBook with 14.1-inch display: 55-watt-hour lithium-ion battery provides up to 6 hours of battery life on a single charge<sup>3</sup>
- Integrated charge indicator LEDs on battery
- Power adapter port

Keyboard

- Built-in full-size keyboard with 77 (U.S.) or 78 (ISO) keys, including 12 function keys, 4 arrow keys (inverted “T” arrangement), and embedded keypad

Trackpad

- Solid-state trackpad provides precise cursor control; supports tap, double-tap, and drag capabilities

Electrical requirements

- Line voltage: 100V to 240V AC
- Frequency: 50 to 60 Hz
- Meets ENERGY STAR requirements

Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: –13° to 140° F (–25° to 60° C)
- Relative humidity: 20% to 80% noncondensing
- Maximum operating altitude: 10,000 feet
- Maximum storage altitude: 15,000 feet

Size and weight: iBook with 12.1-inch display

- Width: 11.2 inches (28.5 cm)
- Depth: 9.06 inches (23.0 cm)
- Thickness: 1.35 inches (3.4 cm)
- Weight: 4.9 pounds (2.2 kg)<sup>1</sup>

Size and weight: iBook with 14.1-inch display

- Width: 12.7 inches (32.3 cm)
- Depth: 10.2 inches (25.9 cm)
- Thickness: 1.35 inches (3.4 cm)
- Weight: 5.9 pounds (2.7 kg)<sup>1</sup>

1. Weight varies by configuration.  
2. 1GB = 1 billion bytes; actual formatted capacity less.  
3. Battery life depends on configuration and use.  
4. iPhoto may require Internet download; Internet access fees may apply.  
5. CD burning requires CD-RW drive. iTunes is for legal or rightholder-authorized copying only. Don't steal music.  
6. Actual modem speeds lower; speed depends on connection rate and other factors.  
7. Wireless Internet access requires AirPort Card, AirPort Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions.  
8. Actual rates will vary.

# Power Mac G5 - Technical Specifications

## Power Mac G5 - Technical Specifications

Configurations			
Order no.	M9020LL/A	M9031LL/A	M9032LL/A
G5 Processor	1.6GHz PowerPC G5	1.8GHz PowerPC G5	Dual 2GHz PowerPC G5
L2 Cache	512K	512K	512K per processor
Frontside bus	800MHz	900MHz	1GHz per processor
DDR SDRAM main memory	256MB PC2700 (333MHz) 4GB maximum	512MB PC3200 (400MHz) 8GB maximum	512MB PC3200 (400MHz) 8GB maximum
8X AGP Pro graphics	NVIDIA GeForce FX 5200 Ultra with 64MB DDR SDRAM	NVIDIA GeForce FX 5200 Ultra with 64MB DDR SDRAM	ATI RADEON 9600 Pro with 64MB DDR SDRAM
Hard drive(5)	80GB Serial ATA; 7200 rpm	160GB Serial ATA; 7200 rpm	160GB Serial ATA; 7200 rpm
Optical drive	SuperDrive (DVD-R/CD-RW)	SuperDrive (DVD-R/CD-RW)	SuperDrive (DVD-R/CD-RW)
PCI slots	Three open full-length 33MHz, 64-bit PCI slots	Three open full-length PCI- X slots: one 133MHz, 64-bit slot and two 100MHz, 64-bit slots	Three open full-length PCI- X slots: one 133MHz, 64-bit slot and two 100MHz, 64-bit slots
High performance I/O	One FireWire 800 port, two FireWire 400 ports (one on front); three USB 2.0 ports (one on front), two USB 1.1 ports (on keyboard); AGP 8X Pro slot with graphics card installed, including ADC connector and DVI connector		
Bays	Two internal hard drive bays (1 occupied); one optical drive bay		
Networking	Built-in 10/100/1000BASE-T Ethernet and 56K V.92 modem(13)		
Wireless	AirPort Extreme ready (based on 802.11g specification; IEEE 802.11b Wi-Fi certified)(6); Bluetooth option		
Audio	Optical digital audio in, optical digital audio out, analog audio in, analog audio out, front headphone minijack and speaker		
System software	Mac OS X v10.2 "Jaguar"		
Software	iLife (including iTunes, iPhoto, iMovie and iDVD), QuickBooks for Mac New User Edition, FAXstf, Art Directors Toolkit, Microsoft Office v.X Test Drive, FileMaker Pro Trial, OmniGraffle, OmniOutliner, GraphicConverter, QuickTime, iChat, Safari, Sherlock, Address Book, iCal, iSync, DVD Player, Mail, EarthLink, Acrobat Reader, Classic environment and Apple Developer Tools		
Hardware accessories	Apple Keyboard, Apple Mouse, USB keyboard extension cable, DVI to VGA adapter, modem cable, AirPort antenna		
Limited warranty and service	Your Power Mac G5 comes with 90 days of free telephone support and a one-year limited warranty. Purchase the <a href="#">AppleCare Protection Plan</a> to extend your service and support to three full years. Only the AppleCare Protection Plan provides you with direct telephone support from Apple technical experts and the assurance that repairs will be handled by Apple-certified technicians using genuine Apple parts. For more information, visit <a href="#">Apple support</a> or call 800-823-2775.		
Internet access	All models also include 30 days of free Internet service through EarthLink . Internet access requires a compatible Internet service provider; fees may apply.		

Build-to-Order Options	
Order a custom-configured computer from the online Apple Store or an authorized Apple reseller.	
Memory	(PC2700 or PC3200 DDR SDRAM; installed in pairs): 256MB, 512MB, 1GB, 2GB, 4GB, 8GB (4)
Hard drives (5)	80GB Serial ATA, 160GB Serial ATA, 250GB Serial ATA
Optical drives	SuperDrive (DVD-R/CD-RW), Combo drive (DVD-ROM/CD-RW)
Graphics	NVIDIA GeForce FX 5200 Ultra with 64MB of DDR SDRAM, ATI Radeon 9600 Pro with 64MB of DDR SDRAM, ATI Radeon 9800 Pro with 128MB of DDR SDRAM
Audio	Apple iPod, Logitech Z-680 5.1 speakers, Monster 1m Toslink Digital Fiber Optic Cable, Monster 2m Toslink Digital Fiber Optic Cable
External storage	Xserve RAID with Apple Fibre Channel PCI Card
Wireless	AirPort Extreme Card M8881LL/A AirPort Extreme Base Station M8930LL/A AirPort Extreme Base Station (with modem and antenna port) M8799LL/A Internal Bluetooth module with antenna
Displays	Apple Studio Display (17-inch flat panel) M7649ZM/B Apple Cinema Display (20-inch flat panel) M8893ZM/A Apple Cinema HD Display (23-inch flat panel) M8537ZM/A Apple DVI to ADC Display Adapter M8661LL/A Apple DVI to ADC Video Adapter M9267G/A
Services	AppleCare Protection Plan M8850LL/A .Mac Subscription M8778LL/A

Technical Specifications

Processing

- 1.6GHz, 1.8GHz, or dual 2GHz PowerPC G5 microprocessors
- PowerPC processor architecture with 64-bit data paths and registers
- Native support for 32-bit application code
- 512K on-chip L2 cache running at processor speed
- Parallel data structure supporting up to 215 simultaneous in-flight instructions
- Simultaneous issue of up to 10 out-of-order operations
- Dual-pipeline Velocity Engine for 128-bit single-instruction, multiple-data (SIMD) processing
- Two independent double-precision floating-point units
- Advanced three-stage branch-prediction logic
- 800MHz, 900MHz, or 1GHz 64-bit DDR frontside bus supporting up to 8-GBps data throughput; one on each processor on dual processor systems
- Point-to-point system controller

Memory

- 128-bit data paths for up to 6.4-GBps memory throughput
- 1.6GHz model
  - 256MB of PC2700 (333MHz) DDR SDRAM
  - Four DIMM slots supporting up to 4GB of main memory
- 1.8GHz systems and 2Ghz systems
  - 512MB of PC3200 (400MHz) DDR SDRAM
  - Eight DIMM slots supporting up to 8GB of main memory
- Support for the following DIMMs (in pairs):
  - 128MB DIMMs (64-bit-wide, 128- or 256-Mbit)
  - 256MB DIMMs (64-bit-wide, 128- or 256-Mbit)
  - 512MB DIMMs (64-bit-wide, 256-Mbit)
  - 1GB DIMMs (64-bit-wide, 256-Mbit)

Graphics and displays

- AGP 8X Pro graphics slot supporting up to 2-GBps data throughput, with one of the following graphics cards installed:
  - NVIDIA GeForce FX 5200 Ultra with 64MB of DDR SDRAM
  - ATI Radeon 9600 Pro with 64MB of DDR SDRAM
  - ATI Radeon 9800 Pro with 128MB of DDR SDRAM (build-to-order option)
- Support for digital resolutions up to 1920 by 1200 pixels
- Support for analog resolutions up to 1600 by 1200 pixels
- ADC and DVI connectors; DVI to VGA adapter included
- Dual display support for extended desktop and video mirroring modes
- Support for up to two Apple flat panel displays(8)

Storage

- Two Serial ATA controllers supporting up to 150-MBps data throughput per hard drive
- Two 3.5-inch hard drive expansion bays with drive guides for a second drive
  - One 80GB or 160GB 7200-rpm Serial ATA drive installed in standard configurations(5)
  - Support for up to two internal Serial ATA drives; 500GB maximum system capacity(5)
  - 8MB memory buffers on all hard drives
- Optical drive bay with SuperDrive (DVD-R/CD-RW) installed; writes DVD-R discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 32x speed

PCI expansion

- One of the following configurations:
  - Three open full-length 64-bit, 33MHz PCI slots, or
  - One open full-length 64-bit, 133MHz PCI-X slot and two open full-length 64-bit 100MHz PCI-X slots

Communications

- 10/100/1000BASE-T Ethernet connector (RJ-45)
- Built-in 56K V.92 modem (RJ-11) (13)
- Expansion slot for optional 54-Mbps AirPort Extreme Card (based on IEEE 802.11g specification; 802.11b Wi-Fi certified) (6)
- External AirPort Extreme antenna
- Optional Bluetooth 1.1 module and antenna

Peripherals and audio

- One FireWire 800 port and two FireWire 400 ports (one on front panel, 15W total power)
- Three USB 2.0 ports (on one front panel), two USB 1.1 ports on keyboard
- Front headphone minijack and speaker
- Optical digital audio in and out Toslink connectors
- Stereo audio in and out minijacks

Electrical and environmental requirements

- Meets ENERGY STAR requirements
- Line voltage: 100-125V AC or 200-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum current: 6.5A (low-voltage range) or 7.5A (high-voltage range)
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

Size and weight

- Height: 20.1 inches (51.1 cm)
- Width: 8.1 inches (20.6 cm)
- Depth: 18.7 inches (47.5 cm)
- Weight: 39.2 pounds (17.8 kg) (14)



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1. Tests performed by Apple in June 2003 using preproduction Power Mac G5 units. The Power Mac systems ran a PowerPC G5 — optimized version of Photoshop 7.0.1 including optimized AltiVecCore, ACE, and BIB Carbon Libraries; the Dell Dimension ran Photoshop 7.0.1.
2. “World’s fastest” based on SPEC CPU2000 benchmark results and leading professional application performance tests against 3GHz Pentium 4 — based Dell Dimension 8300 and dual 3.06GHz Xeon-based Dell Precision Workstation 650. SPEC CPU2000 benchmarks run with GCC 3.3 compiler and independently tested; professional applications tested by Apple, June 2003.
3. Based on SPEC CPU2000 benchmark results against 3GHz Pentium 4 — based Dell Dimension 8300 and dual 3.06GHz Xeon-based Dell Precision Workstation 650, run with GCC 3.3 compiler and independently tested, June 2003.
4. Selected models.
5. 1GB = 1 billion bytes; actual formatted capacity less.
6. Achieving data rates of 54 Mbps requires that all users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. If any user of Wi-Fi certified 802.11b products joins the network, that user will get up to 11 Mbps and AirPort Extreme network users will get less than 54 Mbps. Actual speed will vary based on range, connection rate, site conditions, size of network, and other factors.
7. Check with manufacturer for compatibility.
8. Second Apple flat-panel display requires Apple DVI to ADC Adapter, sold separately.
9. Actual rates will vary.
10. Preliminary specifications based on preproduction Power Mac G5 units.
11. Based on SPEC CPU2000 benchmark results against 3GHz Pentium 4 — based Dell Dimension 8300 and dual 3.06GHz Xeon-based Dell Precision Workstation 650m, performed by VeriTest, June 2003.
12. Tests performed by Apple in June 2003 using preproduction Power Mac G5 units with application software optimized for the PowerPC G5.
13. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower.
14. Weight varies by configuration and manufacturing process.

Internet access requires a compatible Internet service provider; fees may apply.

Product contains electronic documentation.

Backup copy of software is included.

**Published Date:** Jul 26, 2017

# AirPort Base Station (Dual Ethernet) - Technical Specifications

## AirPort Base Station (Dual Ethernet) - Technical Specifications

Technical Specifications	
The AirPort Base Station (Dual Ethernet) can serve up to 50 users (See Note 1). It includes a base unit, external power supply, telephone cord, wall mount bracket, and software.	
<b>Wireless data rate</b> <ul style="list-style-type: none"><li>Up to 11 Mbps (data rate depends on environment)</li></ul>	<b>Included software</b> <ul style="list-style-type: none"><li>AirPort application - change networks and check signal strength (for Mac OS 9).</li><li>AirPort Control Strip module - quickly measure signal strength or change networks (for Mac OS 9).</li><li>AirPort Setup Assistant - set up the computer for network access and set up an AirPort Base Station (for Mac OS 9 and X).</li><li>AirPort Admin Utility - base station network administration (for Mac OS 9 and X).</li><li>Designing AirPort Networks 2 PDF document</li><li>AOL Extras</li></ul>
<b>Range</b> <ul style="list-style-type: none"><li>Up to 168-foot (50 m) radius from the base station in typical use. Range varies with site conditions.</li></ul>	<b>Electrical requirements</b> <i>North America and Japan</i> <ul style="list-style-type: none"><li>Line voltage: 100 V to 120 V AC</li><li>Frequency: 50 Hz to 60 Hz</li></ul> <i>Europe, Australia</i> <ul style="list-style-type: none"><li>Line voltage: 200 V to 240 V AC</li><li>Frequency: 50 Hz to 60 Hz</li></ul>
<b>Frequency band</b> <ul style="list-style-type: none"><li>2.4 GHz spread spectrum</li></ul>	<b>Environmental requirements</b> <ul style="list-style-type: none"><li>Operating temperature: 32 F to 95 F (0 C to 35 C)</li><li>Storage temperature: -13 F to 140 F (-25 C to 60 C)</li><li>Relative humidity, operational: 20 to 80 percent</li><li>Relative humidity, storage: 10 to 90 percent, noncondensing</li><li>Operating altitude: 0 to 10 000 feet (0 to 3048 m)</li><li>Maximum storage altitude: 15 000 feet (4572 m)</li></ul>
<b>Radio output power</b> <ul style="list-style-type: none"><li>15 dbm (nominal)</li></ul>	<b>Size and mass</b> <ul style="list-style-type: none"><li>Diameter: 6.9 inches (175 mm)</li><li>Height: 3.2 inches (80 mm)</li><li>Mass (weight, without wall mount bracket): 1.25 pounds (565 grams)</li></ul>
<b>Positioning options</b> <ul style="list-style-type: none"><li>Desktop</li><li>Wall (mounting bracket included)</li></ul>	<b>System requirements</b> <i>For Macintosh users</i> <ul style="list-style-type: none"><li>An Apple computer with an antenna and AirPort Card</li><li>Mac OS 9.0.4 or later or Mac OS X 10.1 or later</li></ul> <i>For PC users</i> <ul style="list-style-type: none"><li>At least one AirPort-enabled Apple computer (to set up the base station)</li><li>A PC with a Wi-Fi-certified IEEE 802.11b wireless card</li></ul>
<b>Compatibility</b> <ul style="list-style-type: none"><li>Industry-standard IEEE 802.11b</li><li>Wi-Fi certified</li><li>Works with Windows-based PCs and Mac computers (See Note 2)</li><li>AirPort Setup Assistant to configure the computer and AirPort Base Station for Internet access</li><li>AirPort Admin Utility for base station network administration</li><li>Internet Connect application for dialing support and to monitor connection status, turn AirPort on and off, change networks, and check signal quality (Mac OS X 10.1 only)</li><li>AirPort application to monitor connection status, turn AirPort on and off, change networks, and check signal quality</li><li>AirPort menu bar item to measure signal quality, change networks, and turn AirPort on and off</li></ul>	
<b>AirPort Base Station interfaces</b> <ul style="list-style-type: none"><li>RJ-11 connector for built-in 56K V.90 modem for dialup Internet connections (See Note 3.)</li><li>AirPort</li><li>Power jack (12 V DC)</li><li>RJ-45 connector for built-in 10BASE-T Ethernet for connecting a DSL or cable modem (WAN, "wide area network")</li><li>RJ-45 connector for built-in 10/100BASE-T Ethernet for connecting to wired computers (LAN, "local area network")</li></ul> <p><b>Note:</b> When connecting the AirPort Base Station (Dual Ethernet) to to another device using Ethernet, a crossover cable is not required. Both the WAN and LAN Ethernet ports automatically detect the type of connection and switch the signal configuration as required. The Ethernet jacks do not accept telephone wire (RJ-11). This has been done to prevent confusion from misplugged wiring. The Ethernet jacks will not allow a telephone wire's clip to insert far enough to lock into place.</p>	

<b>Notes:</b>
<ol style="list-style-type: none"><li>Bandwidth access is dependent on the number of simultaneous users.</li><li>Initial AirPort setup requires an AirPort-enabled Macintosh computer.</li><li>Download speeds vary with line conditions and your ISP's modem capabilities. FCC regulations limit ISP transmission speeds to 53 Kbps in the United States.</li><li>Wireless Internet access requires an Internet service provider (fees may apply) and AirPort (or AirPort-compatible) wireless Ethernet card and base station. Some ISPs are not compatible with AirPort.</li></ol>

# eMac (ATI Graphics) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## eMac (ATI Graphics) - Technical Specifications

Configurations			
Order no.	M9150LL/A	M8950LL/A	M8951LL/A
Processor	800MHz PowerPC G4	1GHz PowerPC G4	1GHz PowerPC G4
System bus	133MHz	133MHz	133MHz
Memory	128MB of SDRAM; supports up to 1GB		256MB of SDRAM; supports up to 1GB
Hard drive <sup>(2)</sup>	40GB Ultra ATA	60GB Ultra ATA	80GB Ultra ATA
Optical drive	CD-ROM	Combo drive (DVD-ROM/CD-RW)	SuperDrive (DVD-R/CD-RW)
Display	17-inch (16-inch viewable) flat CRT		
Graphics support	ATI Radeon 7500 with AGP 4x support; 32MB dedicated DDR SDRAM graphics memory		
Ports	Two FireWire 400 ports, five USB ports (three on system, two on keyboard), mini-VGA output port, headphone jack, audio line in jack		
VGA video mirroring <sup>(3)</sup>	Yes	Yes	Yes
S-video and composite video output <sup>(3)</sup>	Yes	Yes	Yes
Networking	Built-in 10/100BASE-T Ethernet and 56K V.92 modem <sup>(4)</sup>		
Wireless <sup>(5)</sup>	AirPort Extreme ready		
Speakers	Integrated stereo speakers		
System software	Mac OS X version 10.2, Mac OS 9 <sup>(1)</sup>		
Software	QuickTime, iCal, iChat, iLife (includes iTunes, iPhoto, iMovie, and iDVD <sup>(6)</sup> ), iSync, DVD Player, AppleWorks, Mac OS X Mail, Microsoft Internet Explorer, EarthLink (includes 30 days of free service), AOL, Quicken 2003 Deluxe, World Book 2003 Edition, Mac OS X Chess, Otto Matic, Deimos Rising, Microsoft Office v. X Test Drive, Sound Studio, FAXstf and Acrobat Reader; Apple Hardware Test CD		
Service and support	90 days of free telephone support and one-year limited warranty		
Hardware Accessories	Apple Keyboard, Apple Mouse, modem cable		

Build to Order Options	
Order a custom-configured computer from the online <a href="#">Apple Store</a> or an Apple Authorized Reseller.	
eMac Tilt and Swivel Stand M8784G/A	AirPort Extreme Card M8881LL/A
AirPort Extreme Base Station M8930LL/A	AirPort Extreme Base Station with modem and antenna port M8799LL/A
Apple Video Adapter M9109G/A	Apple VGA Display Adapter M8639G/A
Apple FireWire Cable (4-pin to 6-pin) M8706G/A	Apple 4x DVD-R Media Kit M8985G/A
D-Link USB Bluetooth Adapter T6295ZM/A	.Mac M8778LL/A
AppleCare Protection Plan M8851LL/B	

### Technical Specifications

# 98\_eMac (ATI Graphics) - Technical Specifications.pdf

## Processor and memory

- 800MHz or 1GHz PowerPC G4 processor with Velocity Engine
- 256K on-chip level 2 cache at full processor speed
- 133MHz system bus
- 128MB or 256MB of PC133 SDRAM, expandable up to 1GB; two user-accessible 168-pin DIMM slots support up to 1GB using 128MB, 256MB, or 512MB DIMMs

## Storage

- 40GB, 60GB or 80GB Ultra ATA hard disk drive (2)
- One of the following optical drives:
  - CD-ROM drive; reads CDs at up to 32x speed
  - Combo drive (DVD-ROM/CD-RW); reads DVDs at up to 8x speed, writes CD-R discs at up to 32x speed, writes CD-RW discs at up to 10x speed, reads CDs at up to 32x speed
  - SuperDrive (DVD-R/CD-RW); writes DVD-R discs at up to 4x speed, reads DVDs at up to 8x speed, writes CD-R discs at up to 16x speed, writes CD-RW discs at up to 8x speed, reads CDs at up to 32x speed

## Display

- Built-in 17-inch flat CRT (16-inch diagonal viewable image size); 0.25-mm dot pitch

## Communications

- Built-in 56K V.92 modem (RJ-11 connector) (4)
- Built-in 10/100BASE-T Ethernet (RJ-45 connector)
- Built-in antennas and expansion slot for optional 54-Mbps AirPort Extreme Card (5)

## Video

- Mini-VGA output port (requires Apple VGA Display Adapter sold separately)
- VGA output resolutions:
  - 640 by 480 pixels at 60Hz, 67Hz, 72Hz, 75Hz, 85Hz, 90Hz, 100Hz, and 120Hz
  - 800 by 600 pixels at 56Hz, 60Hz, 72Hz, 75Hz, 85Hz, 90Hz, 100Hz, and 120Hz
  - 1024 by 768 pixels at 60Hz, 70Hz, 75Hz, 85Hz, 90Hz, and 100Hz
  - 1152 by 870 pixels at 75Hz
  - 1280 by 960 pixels at 75Hz
- S-video and composite video output to connect directly to a TV or projector (requires Apple Video Adapter, sold separately)
- Support for video mirroring: external devices display an image identical to that shown on the built-in display

## Graphics support

- ATI Radeon 7500 graphics processor with AGP 4X support
- 32MB of dedicated Double Data Rate (DDR) SDRAM video memory
- Five screen resolutions: 640 by 480 pixels, 800 by 600 pixels, 1024 by 768 pixels, 1152 by 864 pixels, and 1280 by 960 pixels

## Peripheral connections

- Two FireWire 400 ports; 8 watts shared
- Total of five USB 1.1 ports: three on computer (shared on two 12Mbps controllers); two on keyboard

## Audio

- Integrated high-performance stereo audio system
- Internal 16-watt digital amplifier
- Headphone jack (headphones not included)
- Audio line in jack
- Built-in microphone

## Electrical and environmental requirements

- Meets ENERGY STAR and TCO 95 requirements
- Line voltage: configured for 100V AC or 220V AC depending on country of use
- Frequency: 47Hz to 63Hz, single phase
- Maximum continuous power: 170W
- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -40° to 116° F (-40° to 47° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum altitude: 10,000 feet

## Size and weight

- Height: 15.8 inches (40.6cm)
- Width: 15.8 inches (40.6cm)
- Depth: 17.1 inches (43.3cm)
- Weight: 50 pounds (22.7kg) (7)

1. Startup in Mac OS 9 is available only with CD-ROM and Combo drive configurations. All configurations can run Mac OS 9 applications in Mac OS X Classic mode.
2. 1GB = 1 billion bytes; actual formatted capacity less.
3. Requires adapter, sold separately.
4. Compatible ISP and telephone services required. Your ISP may not support all V.92 features. Modem will function according to V.90 standards if V.92 services are not available. Actual modem speeds lower; speed depends on connection rate and other factors.
5. Wireless Internet access requires AirPort Extreme Card, AirPort Extreme Base Station, and Internet access (fees may apply). Some ISPs are not currently compatible with AirPort. Range may vary with site conditions. Achieving data rates up to 54Mbps requires that a II users have an AirPort Extreme Card and connect to an AirPort Extreme Base Station. AirPort Extreme works only in Mac OS X. Wireless printing over USB requires Mac OS X v10.2.3 or later and a compatible printer.
6. iDVD is included on SuperDrive equipped systems only.
7. Weight varies by configuration and manufacturing process.

Published Date: Apr 6, 2016

# iPod with dock connector (10 GB, 15 GB, 20 GB, 30 GB, 40 GB) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## iPod with dock connector (10 GB, 15 GB, 20 GB, 30 GB, 40 GB) - Technical Specifications

Configurations (Mac & Windows)					
Order no.	M8976LL/A	M8946LL/A & M9460LL/A	M9244LL/A	M8948LL/A	M9245LL/A
Storage	10GB <sup>(2)</sup>	15GB <sup>(2)</sup>	20GB <sup>(2)</sup>	30GB <sup>(2)</sup>	40GB <sup>(2)</sup>
Battery life	Over 8 hours <sup>(5)</sup>				
Skip protection	Up to 25 minutes				
Display	2-inch (diagonal) grayscale LCD with LED backlight				
Ports	Dock connector, remote connector, stereo minijack				
Charge time	3 hours (1-hour fast charge to 80% capacity)				
Audio support for Mac	AAC (16 to 320 Kbps), MP3 (32 to 320 Kbps), MP3 VBR, Audible <sup>(6)</sup> , AIFF, WAV				
Audio support for Windows	MP3 (32 to 320 Kbps), MP3 VBR, WAV				
Size	4.1 by 2.4 by 0.62 inches			4.1 by 2.4 by 0.73 inches	
Weight	5.6 ounces			6.2 ounces	
Included accessories	Earbud headphones, AC adapter, dock connector to FireWire cable, 4-pin-to-6-pin FireWire adapter.	Dock, remote, carrying case, earbud headphones, AC adapter, dock connector to FireWire cable and 4-pin-to-6-pin FireWire adapter. (M9460LL/A did not include dock or carrying case)			
Optional accessories	Dock; earbud headphones and remote; carrying case; AC adapter; dock connector to FireWire cable; dock connector to USB 2.0 + FireWire cable <sup>(4)</sup> ; world travel adapter kit				
Mac Requirements and Software	Apple computer with built-in FireWire port; Mac OS X v10.1.5 or later (Mac OS X 10.2 or later recommended); CD includes iTunes <sup>(7)</sup> for Mac OS X				
Windows Requirements and Software	PC with built-in FireWire or USB 2.0 <sup>(4)</sup> , or Windows-certified FireWire or USB 2.0 card; Windows Me, Windows 2000 or Windows XP Home or Professional; CD includes MUSICMATCH Jukebox Plus 7.5 software				

Other Options	
iPod Dock M9130G/A	Remote & Earbud Headphones M9128G/A
Carrying Case with Belt Clip M9129G/A	Dock Connector to FireWire Cable M9127G/A
Dock Connector to USB 2.0 + FireWire cable M9126G/A	World Travel Adapter Kit M8794LG/A
Belkin Car Adapter T6715LL/A	Belkin Battery Pack T6714LL/A

### Technical Specifications

# 99\_iPod with dock connector (10 GB, 15 GB, 20 GB, 30 GB, 40 GB) - Technical Specifications

<b>Capacity</b> <ul style="list-style-type: none"><li>10GB, 15GB, 20GB, 30GB, or 40GB hard disk drive<sup>(2)</sup><ul style="list-style-type: none"><li>Holds over 2500, 3700, 5000, 7500, or 10000 songs in 128-Kbps AAC format<sup>(3)</sup></li><li>Stores data in FireWire or USB 2.0<sup>(4)</sup>disk mode</li></ul></li></ul>	<b>Size and weight (10GB model)</b> <ul style="list-style-type: none"><li>Height: 4.1 in</li><li>Width: 2.4 in</li><li>Depth: 0.62 in</li><li>Weight: 5.6 oz (158 g)</li></ul> <b>Size and weight (15GB model)</b> <ul style="list-style-type: none"><li>Height: 4.1 in</li><li>Width: 2.4 in</li><li>Depth: 0.62 in</li><li>Weight: 5.6 oz (158 g)</li></ul> <b>Size and weight (20GB model)</b> <ul style="list-style-type: none"><li>Height: 4.1 in</li><li>Width: 2.4 in</li><li>Depth: 0.62 in</li><li>Weight: 5.6 oz (158 g)</li></ul> <b>Size and weight (30GB model)</b> <ul style="list-style-type: none"><li>Height: 4.1 in</li><li>Width: 2.4 in</li><li>Depth: 0.73 in</li><li>Weight: 6.2 oz (176 g)</li></ul> <b>Size and weight (40GB model)</b> <ul style="list-style-type: none"><li>Height: 4.1 in</li><li>Width: 2.4 in</li><li>Depth: 0.73 in</li><li>Weight: 6.2 oz (176 g)</li></ul>	<b>Input and output</b> <ul style="list-style-type: none"><li>Dock connector</li><li>3.5-mm stereo headphone jack</li><li>Wired remote connector</li></ul> <b>Environmental requirements</b> <ul style="list-style-type: none"><li>Operating temperature: 32° to 95° F (0° to 35° C)</li><li>Non operating temperature: -4° to 113° F (-20° to 45° C)</li><li>Relative humidity: 5% to 95% noncondensing</li><li>Maximum operating altitude: 10,000 feet (3000 m)</li></ul> <b>Power and battery</b> <ul style="list-style-type: none"><li>Built-in rechargeable lithium ion battery (630 mAh)</li><li>Playtime: 8 hours when fully charged</li><li>Standby time: 2 weeks when fully charged</li><li>Charging via FireWire connector to computer system or power adapter<ul style="list-style-type: none"><li>Fast-charge time: 1 hour (charges up to 80% of battery capacity)</li><li>Full-charge time: 3 hours</li></ul></li></ul> <b>Power adapter</b> <ul style="list-style-type: none"><li>6-pin FireWire connector</li><li>AC input: 100V to 240V at 0.4 amp maximum</li><li>Frequency: 50Hz to 60Hz</li><li>DC output: 12V at 1 amp maximum</li></ul>
<b>Customizable settings</b> <ul style="list-style-type: none"><li>Customize main menu</li><li>Create On-The-Go playlists</li><li>Rate songs</li><li>Shuffle songs or albums</li><li>Repeat one or all</li><li>Sound Check on or off</li><li>20 Equalizer settings</li><li>Backlight timer</li><li>Display contrast</li><li>Alarms on, off or silent</li><li>Sleep timer</li><li>Date and time</li><li>Display time in menu bar</li><li>Contacts sort and display by first or last names</li><li>Clicker on or off</li><li>Languages: English, French, German, Japanese, Spanish, Italian, Dutch, Danish, Norwegian, Portuguese, Finnish, Swedish, Korean, Simplified Chinese, Traditional Chinese</li></ul>	<b>Display</b> <ul style="list-style-type: none"><li>2-inch (diagonal) liquid crystal display with white LED backlight</li><li>160-by-128-pixel resolution, 0.24-mm dot pitch</li><li>Support for display of multiple languages and characters simultaneously</li></ul> <b>Headphones</b> <ul style="list-style-type: none"><li>Earbud-style headphones with 18-mm drivers using Neodymium transducer magnets</li><li>Frequency response: 20Hz to 20,000Hz</li><li>Impedance: 32 ohms</li></ul>	<b>Audio</b> <ul style="list-style-type: none"><li>Up to 25 minutes of skip protection</li><li>Maximum output power: 60 mW rms (30 mW per channel)</li><li>Frequency response: 20 Hz to 20,000 Hz</li><li>Audio formats supported:<ul style="list-style-type: none"><li>Mac: AAC (up to 320 Kbps), MP3 (up to 320 Kbps), MP3 Variable Bit Rate (VBR), WAV, AIFF, Audible (Mac only)</li><li>Windows: MP3 (up to 320 Kbps), MP3 Variable Bit Rate (VBR), WAV</li></ul></li><li>Upgradable firmware enables support for future audio formats</li></ul>

(1) Weight varies by configuration.  
(2) 1GB = 1 billion bytes; actual formatted capacity less.  
(3) Capacity based on 4 minutes per song and 128-Kbps AAC or MP3 encoding.  
(4) USB 2.0 connection is for Windows PCs only; requires USB 2.0 + FireWire Cable and free software update.  
(5) Battery life varies by use.  
(6) Actual rates will vary.  
(7) iPod and iTunes/MUSICMATCH Jukebox are for legal or rightholder-authorized copying only. Don't steal music.

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# AirPort Time Capsule 802.11n (1st Generation) - Technical Specifications

This article has been archived and is no longer updated by Apple.

## Size and weight

- Length: 7.7 inches (197 mm)
- Width: 7.7 inches (197 mm)
- Height: 1.4 inches (36.3 mm)
- Weight: 3.5 pounds (1587 grams)<sup>1</sup>

## Security

- Wi-Fi Protected Access™ (WPA/WPA2)<sup>2</sup>
- Wireless security (WEP) configurable for 40-bit and 128-bit encryption
- MAC address filtering
- NAT firewall
- Support for RADIUS authentication
- 802.1X, PEAP, LEAP, TTLS, TLS, FAST
- Time-based access control

## Electrical

- Line voltage: 100-240V AC
- Frequency: 50Hz to 60Hz, single phase
- Maximum continuous power: 30W

## Agency approvals

- FCC Part 15 Class B, Canada RSS-210, EN 300-328, EN 301-489, EN 301 893, ARIB STD-T66, RCR STD-T33, AS/NZS 4268:2003, UL 60950, CSA-C22.2 No. 60950

## Storage

- 500GB or 1TB 7200-rpm Serial ATA server-grade hard disk drive<sup>3</sup>

## Interfaces

- One Gigabit Ethernet WAN port for connecting a DSL or cable modem
- Three Gigabit Ethernet LAN ports for connecting computers or network devices
- USB port for connecting a USB printer or USB external hard drive
- 802.11n wireless<sup>4</sup>

## Included software and accessories

- AirPort Utility for Mac and Windows
- AirPort Disk Utility for Mac and Windows
- 802.11n Enabler for Mac<sup>5</sup>
- Bonjour for Windows
- Power cord
- Printed and electronic documentation

## Environmental requirements

- Operating temperature: 50° to 95° F (10° to 35° C)
- Storage temperature: -13° to 140° F ( -25° to 60° C)
- Relative humidity (operational): 20% to 80% (non-condensing)
- Relative humidity (storage): 10% to 90%
- Maximum operating altitude: 10,000 feet

## Wireless protocols

- Draft 802.11n<sup>4</sup>
- 802.11a/b/g

## Compatibility

- Interoperable with Wi-Fi Certified 802.11a, 802.11b, and 802.11g and 802.11n draft 2.0 Mac computers, Windows-based PCs, and other Wi-Fi devices
- NAT, DHCP, PPPoE, VPN Passthrough (IPSec, PPTP, and L2TP), DNS Proxy, SNMP, IPv6 (6to4 and manual tunnels)

## Frequency bands

- 2.4GHz or 5GHz

## Radio output power

- 20 dBm (nominal)

## Channels

- Channels 1-11, 36-48, and 149-165 approved for use in the United States and Canada
- Channels 1-13 and 36-64 approved for use in Japan
- Channels 1-13 and 36-140 approved for use in Europe

# 9\_AirPort Time Capsule 802.11n (1st Generation) - Technical Specifications.pdf

- Channels 1-13, 36-64, and 149-165 approved for use in Australia, Hong Kong, and New Zealand

## System Requirements

	For Mac Users	For PC Users
For backup using Time Machine	Mac computer with Mac OS X v10.5.1 or later	-
For setup and administration	Mac with Mac OS X v10.4 or later, CD drive, Ethernet or wireless networking capability	PC with Windows XP (SP2) or Windows Vista, CD drive, Ethernet or wireless networking capability
For wireless client access	Mac with AirPort or AirPort Extreme wireless capability	PC with 802.11a, 802.11b, or 802.11g card
For shared printing with a USB printer	USB printer, Mac with Mac OS X v10.2.7 or later	USB printer, PC with Windows XP (SP2) or Windows Vista; Bonjour for Windows (included on Time Capsule CD)
For AirPort Disk with a USB hard drive	Mac with Mac OS X v10.4.8 or later	PC with Windows XP (SP2) or Windows Vista; Bonjour for Windows (included on Time Capsule CD)

## Extended service and support

The AppleCare Protection Plan for your computer covers Time Capsule.

1. Weight varies by configuration and manufacturing process.
2. Support for Wi-Fi Protected Access (WPA/WPA2) requires Mac OS X v10.3 or later or Windows XP with SP2 or later.
3. 1GB = 1 billion bytes and 1TB = 1 trillion bytes; actual formatted capacity less.
4. Time Capsule is based on an IEEE 802.11n draft specification and is compatible with IEEE 802.11a, IEEE 802.11b, and IEEE 802.11g.
5. The 802.11n Enabler for Mac works with the following computers: MacBook Pro with Intel Core 2 Duo; MacBook with Intel Core 2 Duo; Mac Pro with AirPort Extreme option; iMac with Intel Core 2 Duo (except the 17-inch 1.83GHz iMac).

Wi-Fi Protected Access is a mark of the Wi-Fi Alliance. Wireless Internet access requires a wireless-enabled computer, a base station or other access point, and Internet access (fees may apply). Some ISPs are not currently compatible with Time Capsule. Product specifications are subject to change without notice.

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